Volume 72 No 12
December 2004

# Amateur Radio

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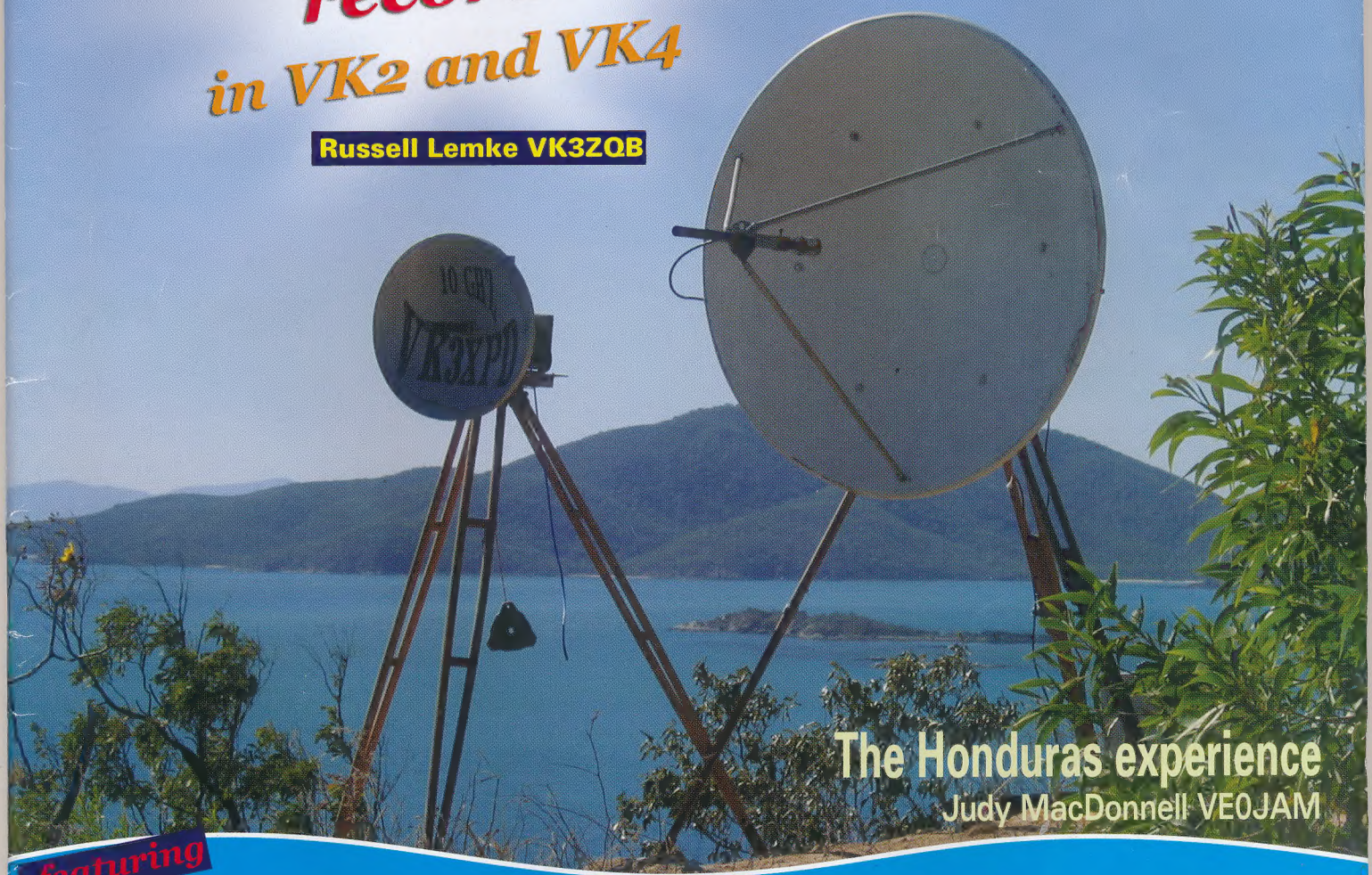
WIRELESS INSTITUTE OF AUSTRALIA

The magazine for AUSTRALIAN radio amateurs

64 page HOLIDAY issue

## New microwave records in VK2 and VK4

Russell Lemke VK3ZQB




## The Honduras experience

Judy MacDonnell VE0JAM

featuring

- A compact, effective vertical antenna for 160 metres
  Drew Diamond VK3XU
- Some useful wire antennas for HF Pt 2
  Rob S Gurr VK5RG
- An experimenter's LF/MF receiver
  Dale Hughes VK2DSH
- A vertical antenna for 15, 17 & 20 metre
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# Amateur Radio

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## Our Cover this month

**Microwave equipment for record attempt at GloucesterPoint Hill. See page 29 for details**

### Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

### Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

### Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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# Editorial comment

**Colwyn Low VK5UE**

## Christmas greetings to all members and readers

**This is larger issue than usual, as the next issue will not be out until February 2005. Aerials are the main topic in this issue. I hope you find some things to think about and some things to do in the articles and columns.**

I note that the ***Spring VHF/UHF Field Day*** seems to have suffered from poor weather. I know I only went out for Saturday afternoon and made six contacts. I seem to have hit a bad patch, the FT-101 gave trouble in the CQ DX Contest and needs attention, the converted Philips 828 for 52 MHz was not completed, the PRM-8030 on 144 MHz seems to have lost output power, the FM-95 on 432 MHz suffered similarly and the 1296 MHz converter was "funny". I got a bit depressed at this point but Steve VK5AIM said his gear was working so we operated a joint station at St Kilda NW of Adelaide. Later I did some checking and found that RG58 is even lossier than I thought at VHF. 10 m is a 3 dB attenuator at 144 MHz and 7 dB at 432. Nothing wrong with the sets, just me. The FT-101 had a major overhaul thanks to John VK5MG and now is almost like new.

The ***Ross Hull VHF Contest*** starts after Christmas and ends on January 15th -16th weekend with the ***Summer VHF/UHF Field Day***. This should give the VHF, UHF, and Microwave enthusiasts some serious challenges.

For the rest of us there should be plenty of opportunities in the long summer evenings to chat with old mates and find some new ones on the HF bands. There might even be the time to accept the challenge of major refurbishment of the station or building a piece of gear that has been wanted for several years.

I would like to think that the National WIA is now settling down and that amateurs are accepting this as the change "that had to happen" and that every effort is being made to ensure continuity of service at the local level. Let us all work together for the good of amateur radio in Australia in 2005.

I attended the wind up of the VK5/8 Division on Friday 19th November. The resolution to terminate the incorporation was passed unanimously by the 70 + members in attendance. Our President Michael Owen attended and in a short speech pointed out that Australia needs one voice to speak on behalf of all amateurs to the ACA and make representations to other levels of government as required. It also needed one voice to speak for Australian Amateurs in IARU. It also needs to have the resources and amateur volunteers to play our part in the IARU and to be part of the Australian delegation to the ITU. The one national Australian radio amateur radio institute should be able to plan our participation in and support of these activities. Keeping the hobby afloat requires major expenditure and it is provided by your subs. The WIA will now also pick up the cost of the repeater network previously funded by Divisions from their share of your subs.

I send you all Christmas Greetings from the Publications Committee of Amateur Radio magazine and we extend our best wishes for 2005 to you all.

In closing my personal Seasons Greetings and Best Wishes to all amateurs for a prosperous and happy 2005.

**73 Colwyn, VK5UE, Editor AR**

***The President, Directors and office staff of the Wireless Institute of Australia***

***wish all members and readers of Amateur Radio***

***a very happy holiday season and a prosperous 2005***

**We will be back to serve you again in February**

Michael Owen VK3KI

# A better qualification system?

**The most common criticism of the amateur examination system conducted by the WIA on behalf of the ACA is that it is too slow and cumbersome, that it takes too long for candidates to receive their results and that there is no automatic or timely indication to the candidate of the areas requiring further attention.**

The system is really a series of steps, with invigilators nominated by clubs that have a group conducting exams, and markers who are separate from the group, with the papers being sent to the WIA office for marking more often than not without even a provisional mark being given to the candidate and with a strict requirement that each step is properly completed before the next step is taken. It doesn't take much for the necessary delay to be extended. If an invigilator forgets, for example, to sign the invigilator's declaration, then when the other documents are received the WIA office must chase him for the missing document and receive it before the next step is taken.

All of this is intended to provide a framework where by a strict separation of the roles of marker and the conduct of the examination and a strict adherence to a protocol, the process can be audited and opportunity for any improper assistance or other impropriety is greatly minimised.

The great advantage of the present system is that it enables clubs across the country to conduct examinations so that they can attract, train and test new amateurs in a local environment. The system is designed to take advantage

in other countries participating in the Recommendation relying on their Australian amateur licence.

I would like to tell you where our thinking is currently at, and to invite our members to express their views on the proposals that we are currently examining.

I stress that this has not been put to the ACA at this stage, and so even if what is suggested is seen as a real solution to a real problem, there can be no guarantee that it will in the end be adopted.

Any assessment system must meet certain requirements, and have certain characteristics. For example:

**Validity:** the skills and knowledge to be checked should be assessed using a methodology that measures what is supposed to be checked. The method or procedure should be relevant to the way in which the application would occur in amateur radio.

**Reliability:** the assessment processes must have the capability to produce consistent results. This includes the need to provide sufficient evidence to make adequate decisions.

**Credibility:** processes and

the basis of the nationally recognised qualifications based on the Australian Qualifications Framework. We are considering a system whereby WIA assessors are formally trained by a Registered Training Organisation (RTO), and accredited and registered by the WIA. Do we need to be satisfied that a registered assessor is a fit and proper person for the task? Perhaps registration could require submission of references and perhaps there could be other requirements.

Assessor registration would last for a period, say three or five years, after which time the assessor would be reviewed and where appropriate re-registered by the WIA. An audit procedure would be established and all assessors would be subject to audit.

These WIA registered assessors will be approved to assess all amateur examinations.

In addition to these assessors, there would be a small number of nominated special assessors. These would have a higher qualification, often people trained appropriately as teachers or the like, with their qualifications recognised for the purpose of their accreditation.

These nominated assessors would be

able to administer

# WIA news

## WIA Proposes Technical Interference Advisory Service

Recently the WIA Board considered a suggestion by Ron Bertrand, VK2DQ, suggesting the establishment of a Technical Interference Advisory Service for members.

The interference most likely to cause a member to seek help is interference to domestic appliances, such as radios, television, amplifiers and the like. Ron suggested that experienced volunteers around the country could provide the service.

The Board thought that the suggestion to have considerable merit.

The Board considered that such a service would need to be carefully structured, as it would be very easy for the volunteers to become involved in disputes, which was not intended. Such a service could not be involved in dispute resolution, nor interference caused by one amateur to another, or indeed any aspects of individual behaviour, whether a vendetta by one neighbour against another or conflict between amateurs.

Glenn Dunstan, VK4DU has agreed to be the director responsible for the project, and the Board has appointed Gilbert Hughes, VK1GH, as National Coordinator.

## Ernie Hocking resigns as WIA Director

WIA Director and Vice President, Ernie Hocking VK1LK has advised the WIA Board of his resignation as a director of the WIA and therefore as Vice President.

Ernie has told the board that his ongoing heavy work commitment means that he is unable to contribute as actively to the WIA as he would like, and that given the importance of establishing a fully functional national body, he would prefer to stand aside to allow someone else to replace him.

He told the board "I can assure you of my continued support for the Institute and its current efforts to establish a truly national peak body to represent the best interests of amateur radio in Australia."

The board has accepted Ernie's resignation "with regret and gratitude for his extraordinary contribution to the WIA".

Michael Owen, VK3KI, WIA President paid tribute to Ernie's vision and contribution to the restructuring of the WIA, and said that the WIA cannot afford to lose his experience.

Ernie has accepted the position of Special Advisor to the Board.

## Board appoints VK3KRB as new director

The Constitution of the WIA requires the Board to fill the vacancy created when a director resigns.

The Board has appointed Robert Broomhead, VK3KRB, a director of the WIA to fill the vacancy created by the resignation of Ernie Hocking as a director for the remainder of the term of Ernie's appointment.

Robert's voice is well known to many amateurs, as he has been a member of the WIA news presentation team. He has been deeply involved in his local club, the Eastern and Mountain District Radio Club, and is currently its Vice President.

He is yet another member of the board with a significant club background.

## The Amateur Radio 2005 Events Calendar

The WIA has placed an Events Calendar on the national website (www.wia.org.au) so that when a club is planning an event, or a contest, you know in advance what else is going on.

You can find it by clicking on Member Services, and then, Coming Events.

Ted Thrift, VK2ARA, director with special responsibility for clubs, says that if your club wants to be part of the 2005 Events Calendar and make sure that your club gets a good shot at the action, send your 2005 Events Calendar to him at tthrift@iprimus.com.au.

## WIA Summary of the FCC Report and Order on Access BPL

The US Federal Communications Commission (FCC) has published its full Report and Order on Access to BPL.

The FCC says that it wishes to develop policies encouraging the implementation of BPL bringing an end to the broadband duopoly of cable modem and DSL service, while managing the technologies' interference potential.

WIA director with special responsibility for BPL, Phil Wait, VK2DKN, has placed on the WIA National website a summary of the extensive FCC material.

## Victoria Club Forum Report

The WIA is moving ahead even faster following the Victoria Clubs Forum held on Saturday 23 October and attended by 15 radio clubs.

Barry Robinson, VK3JBR, who chaired the meeting organised by the WIA Victorian Advisory Committee and Amateur Radio Victoria said that the Forum lived up to its expectations in providing an excellent networking opportunity for radio club officials.

In addressing the gathering, WIA National President Michael Owen, VK3KI, described the WIA as being in a period of evolution, with a good structure in place, and seeking feedback from radio clubs on a range of matters.

A spirited discussion took place on possible criteria for club affiliation with the WIA.

All clubs were keenly interested in learning about the Foundation Licence that is due to be introduced next year. The WIA has produced a draft syllabus.

VK3KI said that the Board is now considering how best to conduct the practical assessment element of the Foundation Licence. This may require examiners undergoing an accreditation course.

In concluding the Forum VK3KI expressed his appreciation to the organisers, and praised the quality feed back he had received from the club delegates.

## UK Amateurs Gain 7.1 - 7.2 MHz

The Radio Society of Great Britain announced on October 29 that all necessary procedures required for early

*continued on page 26*

# A compact, effective vertical antenna for 160 metres

## Part 1

Drew Diamond VK3XU

**Our lowest band, 160 metres ("Top Band" - 1.800 to 1.875 MHz) continues to attract new enthusiasts. The amateur with a reasonably tall mast, or tower, can usually erect a wire antenna of sufficient height and length to put out a good signal. But limited space and height is a problem for some of us, so what can we do?**

Vertically polarised, ground-wave propagation is almost universally used for cross-town working, and the usual method of creating such a wave is with a vertical antenna of some kind. At night, a vertical antenna is also good for long-distance work.

The impedance measured at the base of a resonant ¼-wave radiator with respect to a good ground system (Figure 1) is of the order of 30 or 36 ohms (Reference 1), where most of that 36 ohms is "radiation" resistance (Rrad), which represents that part of the antenna load that does useful work as radiation. In series with Rrad is the loss resistance Rloss (Figure 2), usually represented by a lump sum of all those effective resistances that waste power as heat, such as earth/ground resistance, conductor resistance, dielectric losses and losses caused by the proximity of poorly conducting bodies such as trees and buildings.

A radiator smaller than ¼ wavelength (Figure 3) will exhibit a rapidly decreasing Rrad, as it is shortened. At 0.1 wavelength (16 m physical), Rrad will be about 9 ohms. If Rloss is also 9 ohms, then half the power delivered to the system will be wasted, even if Rrad + Rloss is efficiently matched (with a suitable network) to our transmission line. Hence, for any radiator worked against ground, best efficiency is obtained when all resistance losses are kept to a minimum (Reference 1). In series with Rrad and Rloss is a reactive (X) component of the impedance. Being shorter than ¼ wave, this reactance will be capacitive, usually expressed as -jX, and of rapidly increasing reactive value as the radiator is shortened (Figure 2).

A quarter-wave vertical for 1.8 MHz would be about 40 m tall, and probably well beyond the realm of most urban amateurs. In medium-wave commercial broadcasting, for instance, the optimum radiator is considered to be a $^5/_8$th wave vertical with a multitude of buried ground radials (References 2 and 3), or, at the very least, a quarter-wave with as many ground radials as economically possible. However, by "loading" the radiator, it is easily possible for the amateur to construct a reasonably efficient vertical antenna which is considerably shorter than a physical quarter-wave.

There are two conventional methods of loading a radiator, top-loading by capacitance (or "capacity-hat" loading, Figure 4), and lumped inductive loading (Figure 5). Professional vertical antennas for VLF and LF typically use capacity loading in order to increase the radiation resistance of a physically short antenna (Reference 4). A vertical antenna for 1.8 MHz may also be capacity-hat loaded (Reference 5). However, to work efficiently the system still needs to be physically rather large.

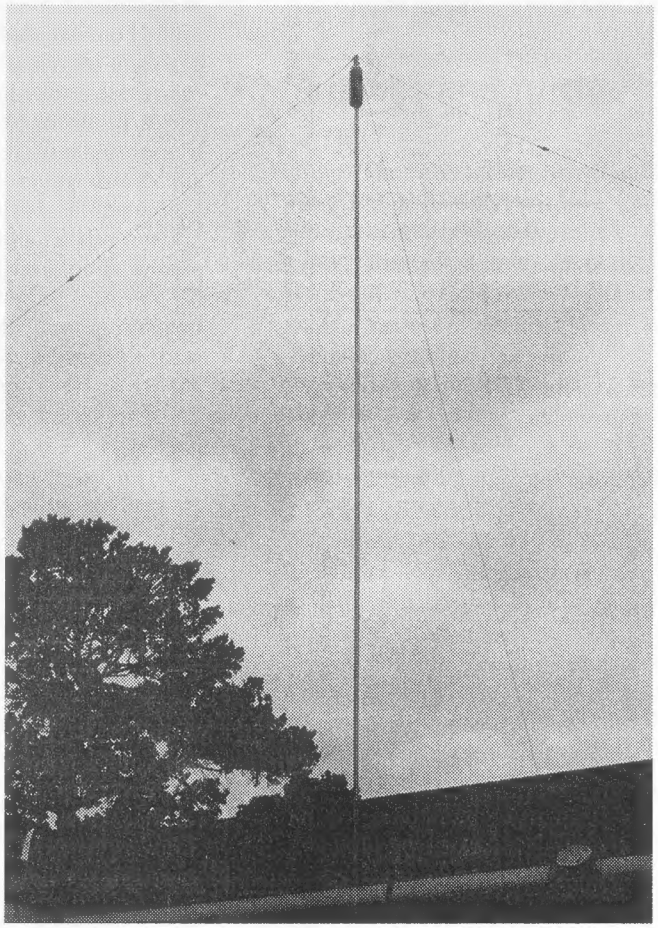

Photo 1 – Loaded vertical for 160 metres

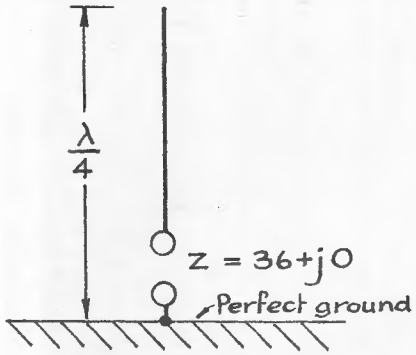


Fig. 1

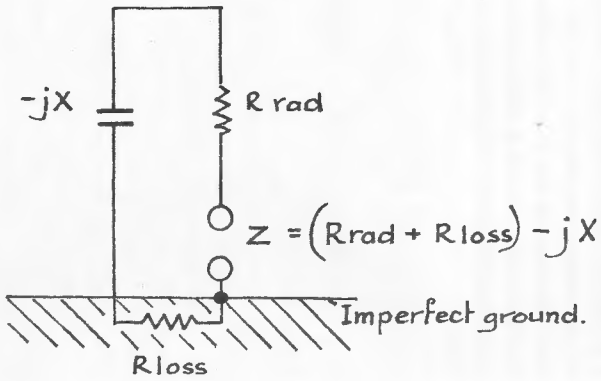


Fig. 2

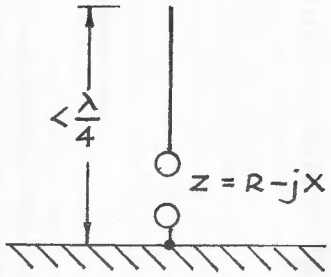


Fig. 3

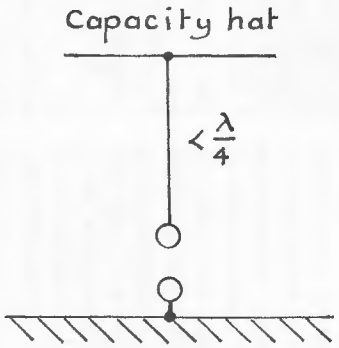


Fig. 4

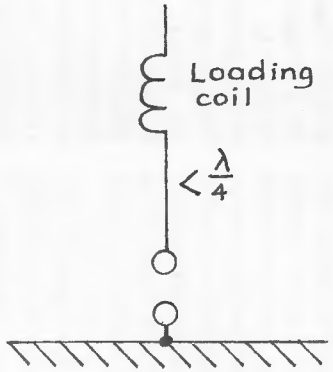


Fig. 5

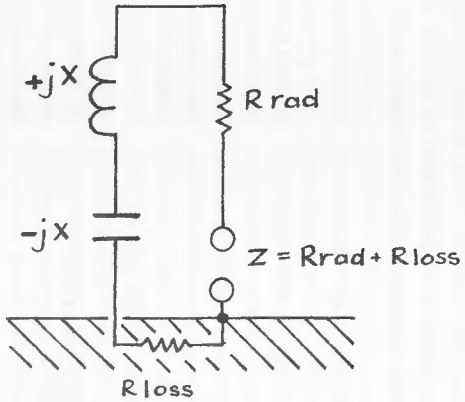


Fig. 6

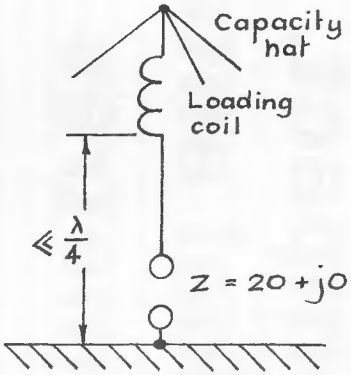


Fig. 7

Figs 1 – 7

Because a short antenna is capacitively reactive, we must add an equal amount of inductive reactance (+jX) to obtain a net reactance of zero (+jX -jX, leaving just Rrad plus Rloss, Figure 6). So, a lumped inductance in the form of a coil or helix may be inserted at some appropriate point in the radiator.

The positioning of the coil is problematic. Even the best made coil will have some loss. When all else is equal, a higher inductance (more turns) will incur a higher I squared R loss. When the coil is at the base, the current through the coil is high, but the inductance required is moderate. As the coil is moved up the radiator, the current falls, but the amount of inductance required increases. It has been found empirically that a position about half-way (or "centre loading") provides a good compromise between coil inductance and coil loss (Reference 6).

If one accepts the popular notion that the strength of the far field is proportional to current flow in the radiator, when placed conveniently at the base, current distribution in the radiator above the coil is poor. Placing the coil further up the radiator improves current distribution (References 6 and 7), but then the need for a gap in the radiator and the mechanical problems of accommodating and protecting the coil (from the weather) may seem difficult.

A good and workable compromise is to adopt a combination of both capacity and inductive loading (Figure 7). By using part of the necessary top guy wires as a capacity hat, and locating the loading coil a short distance below the hat, we obtain a relatively small, practicable antenna (Photo 1) capable of surprisingly good performance.

The goal was to make a vertical antenna using purchasable materials, capable of providing acceptable performance on 1.8 MHz. All electrical joints and connections are kept to a minimum, which prescribes a single length of tube for the vertical part. A height of 6.5 m above the roof should not (it is hoped) cause objectionable visual impact.

A $^{1}/_{16}$th size experimental model of the planned antenna was made for 29 MHz which, after being optimised, and then scaled up in size for 1.8 MHz, allowed use of the 10 x 10 m metal decking roof upon the "granny flat" of our house as a "ground-plane". A stock 6.5 m length of 32 mm diameter aluminium tube forms the vertical component, making the height to the capacity hat apex only about 10 m above ground level.

Much experimental work has been done in arriving at a satisfactory loading coil. Using ordinary white UPVC water pipe as the coil form, various coil configurations were tested, relying greatly on distant reception reports. One very interesting finding, which confirms several statements about the coil's form (eg Reference 8), is that a spaced winding is far superior to close-winding. This observation, and why it should be so, has caused great discussion.

The loaded vertical antenna is quite conventional in operation. The H (magnetic) component is produced mainly by radio-frequency current travelling along the vertical conductor (tube), and the electric (E) field is produced by the capacity hat situated above the vertical. These two fields combine in the near-field to produce a radiated electro-magnetic field.

Many antenna workers declare that the H-field of a lumped coil contributes significantly to the far field. I cannot agree with this assertion, because the H-field produced by the coil is at right-angles to that created by the main vertical current-carrying conductor (right-hand screw rule, see Reference 9). Furthermore, if the coil's field were to contribute (to the far field), then the coil's winding would have to be connected in the correct "phase". No such stipulation is known in this regard.

Back to the coil. The measured capacitance between adjacent close-wound turns (for my coil) is 18 pF, whereas the capacity between turns spaced 4 mm is just 0.4 pF, which represents a 45-fold reduction. The inter-winding capacitances, although they are effectively in series across the length of the coil, ultimately appear in shunt with the capacity hat, thereby reducing the intensity of the electric field. By spacing the turns, we reduce this unwanted capacitance, and its shunting effect, to a very small value.

## Performance

My "reference" antenna is a $^{3}/_{8}$th-wave inverted-L, 10 m high at the shack end rising to about 15 m at the far end, which works rather well both for local cross-town and long-distance work. By switching between the L and the loaded vertical (always remembering to disconnect the other antenna to prevent any coupling effects), signal strength reports were obtained from local (around Melbourne), interstate and DX operators.

Applying AA6GL's vertical antenna software (Reference 10), for an estimated 10 ohms ground loss the antenna has a computed radiation efficiency of about 30 %. The transmitted signal from the vertical is generally about 6 dB better than the L for local ground-wave work. Reports from interstate and the USA were more circumspect due to fading, but certainly the vertical was generally about as good as the inverted-L.

Measured feed-point impedance at the base is 20 ohms (SWR 2.5) at the resonant frequency of 1.840 MHz. At this frequency an SWR of 2.5 is not excessive in good RG-8 coax cable, where the necessary coupler/matching network (described in a forthcoming essay) may therefore be conveniently located at the transmitter end of the coax line. The vertical may thus be effectively operated over the greater portion of the band.

Construction details are given in Part 2.

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8. *The ARRL Antenna Book*; 17th edition, pp 4.19 - 20.
9. *Electrical Technology*; E Hughes; 7th edition, Prentice-Hall, pp131, 132.
10. *Antenna Software* by AA6GL; recent ARRL Handbooks..


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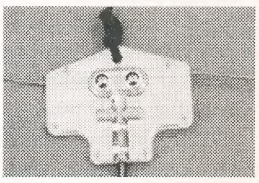

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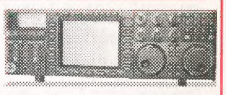

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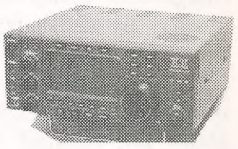

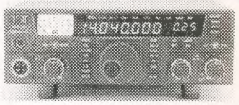

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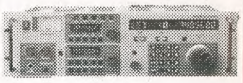

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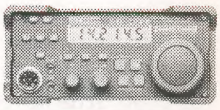

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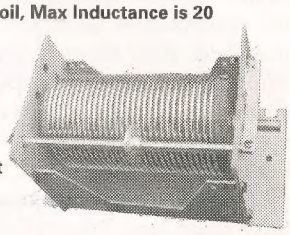

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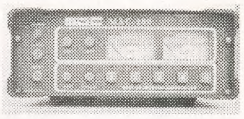

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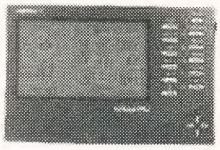

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# Some useful wire antennas for HF – Part 2

**Rob S Gurr VK5RG continues sharing his knowledge of wire antennas with us.**

*(Originally published in Amateur Radio Volume 64, No 4, April 1996)*

## G5RV

This antenna is one of the most popular in use on HF. It first came to amateur attention in 1935, being a design for a multi-directional radiator for 14 MHz. In the late 1940s, G5RV promoted its use as a multiband antenna, fed with a matching stub and a 75 ohm coaxial cable. The antenna on 14 MHz is 1.5 wavelengths long and, with six useful lobes, was much better than a dipole (Fig 9). It followed that the SWR was low on 14 MHz and on some other bands popular at the time, and its use as a universal antenna grew, particularly as any mismatch on these bands could be taken up by the pi network output stages in the valve transmitters in use in those days.

On 3.5 MHz it became a shortened dipole, and on 7 MHz the bidirectional characteristics of a full size dipole were evident. However, with the introduction of solid state equipment with a fixed 50 ohm output impedance, it became necessary to use an antenna coupler with the antenna, and subsequently the later articles show the antenna in the open wire configuration. The directional properties on the various bands were accepted without question, but many experimenters testing the antenna found that often the results obtained were not as good as a previously used dipole. This is common with a lot of short period tests of long wire antennas, where the stations being contacted are located in a deep "null" (Fig 9) giving poor results. However, a station on a bearing only a few degrees away may be of good strength (this aspect of all antennas must be kept in mind when conducting such tests).

The antenna dimensions are 15.54 m each side of centre, and the matching section of open wire line is 10.36 m. However, any length of line should be suitable, if correctly matched with an ATU.

## Terminated Vee Beam

Long wire antennas exhibit considerable gain at little expense (compared to some commercial antennas)(see Fig 12). Regrettably, the gain in some cases is spread over four major "lobes" as well as some smaller lobes. Apart from having gain, there are, unfortunately, directions in between the main lobes where there is very little radiation, or "nulls". This latter property, mentioned before, explains why sometimes an unsuspecting amateur may build a long wire antenna and find it is ineffective, the only stations on the air during his trials probably being in the direction of these "nulls".

The angles of major radiation and the "nulls" can be determined from prepared charts and a combination of "long wires" made to amalgamate these lobes into a useful directional "beam". Two popular antennas are the "Vee Beam" and the "Rhombic" which, in their standard form, are bidirectional, but when "terminated" become unidirectional in the direction of the termination.

The rhombic is a little large for suburban backyards but, where space is available, it is a high grade antenna.

The "Vee" beam also requires a large area. However, in case a suitable space is available, or there are some friendly neighbours, I will describe a terminated "Vee Beam" with special features.

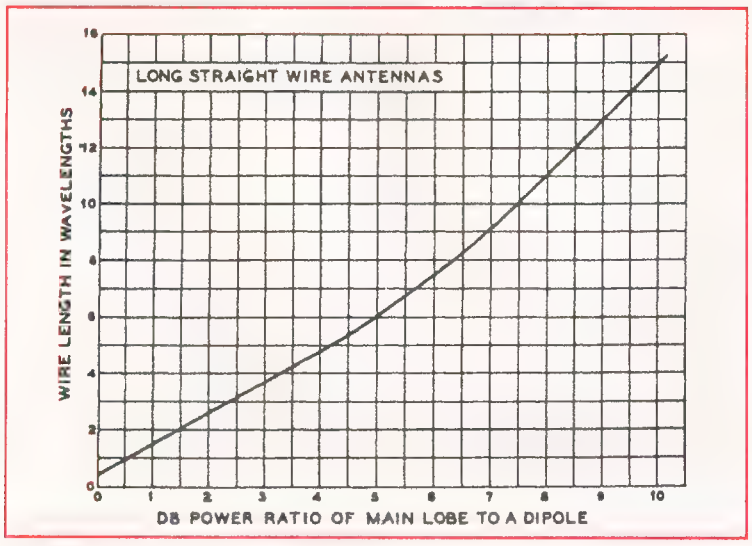



Fig 12 – Directive gain of long wire antenna.
(Reprinted from the Radio Handbook, 21st edition, page 28-3)

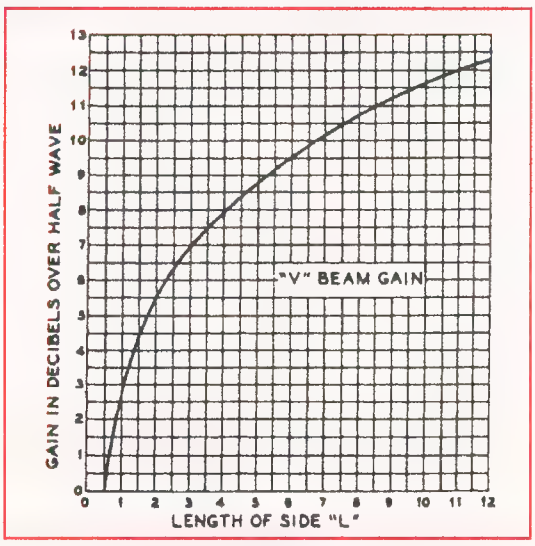



Fig 13 – Directive gain of a V beam.
(Reprinted from the Radio Handbook, 21st edition, page 28-5)

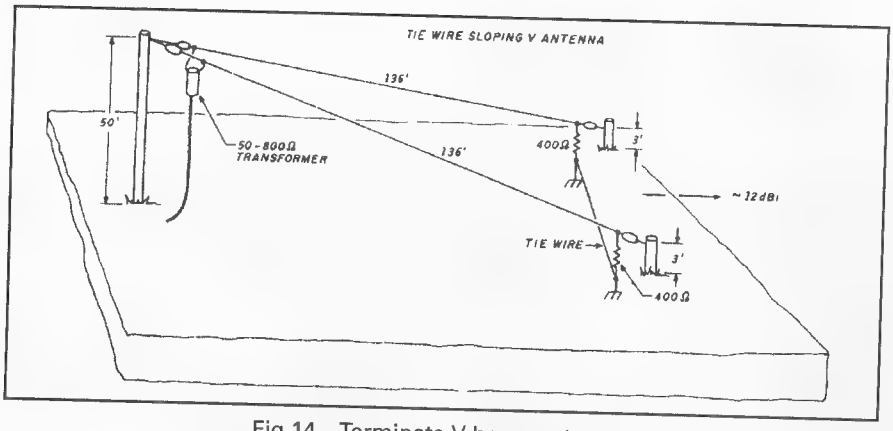



Fig 14 – Terminate V beam antenna.
(Reprinted from Ham Radio, May 1990, page 49)

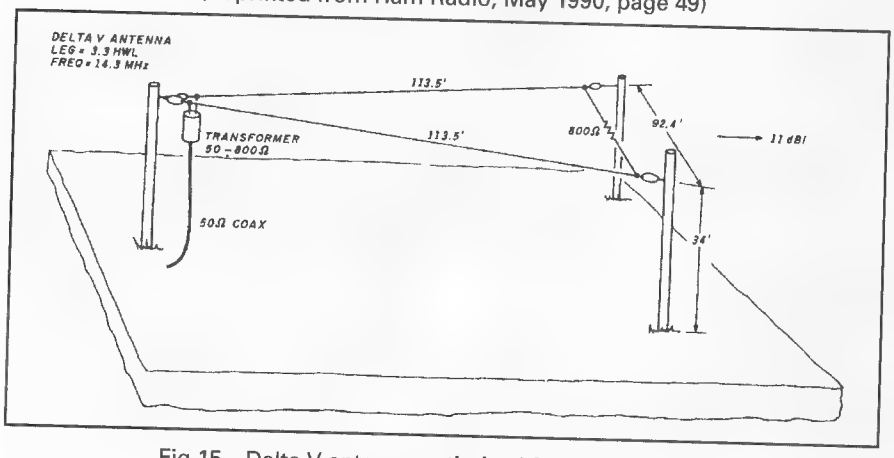



Fig 15 – Delta V antenna optimised for the 20 m band.
(Reprinted from Ham Radio, May 1990, page 52)

| Leg length (half wave-length) | Delta gain (dBi) | V gain (dBi) | Comments |
|---|---|---|---|
| 1.7 | 9.3 | 9.4 | Compact antennas |
| 2.1 | 9.9 | 9.9 | Compact antennas |
| 3.3 | 12.4 | 11.0 | Best Delta trade-off |
| 6.0 | 12.0 | 12.8 | |
| 7.5 | 12.8 | 13.6 | |
| 8.7 | 12.9 | 13.5 | |
| 10.0 | 13.1 | 14.9 | Highest gain size |

Fig 16 – Table 2
"Magic" leg lengths in half waves for Delta and V antennas. (Other delta dimensions are not recommended.)
(Reprinted from Ham Radio, May 1990, page 51)

## The Vee beam

The lobes of two long wires may be combined into forming a Vee Beam, with gain, as shown in Fig 13. The resultant bidirectional pattern may be made unidirectional by terminating each distant end with a 400 ohm resistor to ground, with a benefit of up to 3 dB additional gain (Fig 14). The height of the apex of the "Vee" should be at least 10 metres, whilst that at the ends need only be adequate to clear pedestrians, and animals if on a farm paddock.

The slope of the wires gives further enhancement to the unidirectional properties. When the terminating resistors are returned to ground, the suitability of the ground conductivity is often suspect, to the extent some constructors put in a ground wire immediately below the antenna wires. A now popular method of avoiding this ground return problem is to connect the two wires together, across the base of the Vee, and connect them together with a termination resistor of double the value (ie 800 ohms).

Fig 15 shows the dimensions pictorially, and a chart showing potential gain is shown in Fig 16. As is evident, there is every reason to expect good results from such an antenna.

## The W8JK antenna

First published in the late 1930s, an article on end-fire antenna arrays, by Dr John Kraus in the USA, presented to the engineering world an interesting multiband gain antenna suitable for

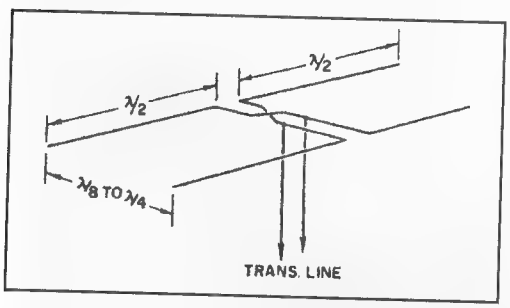
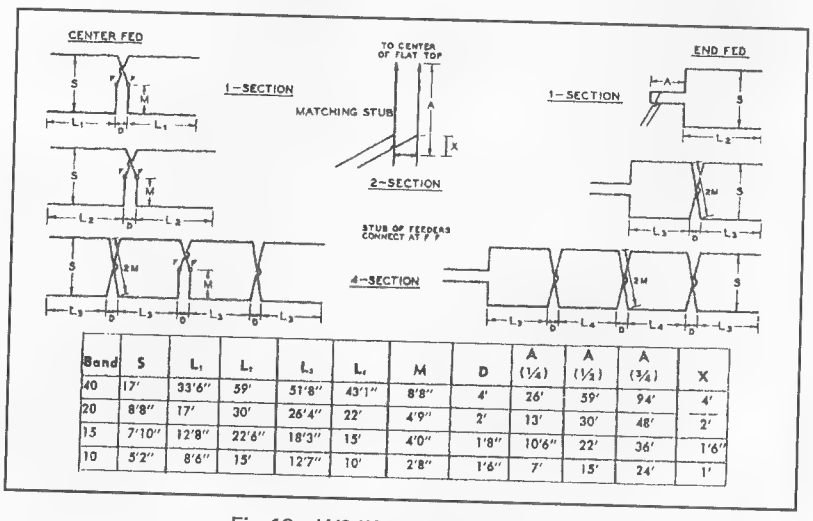



Fig 17 – A four-element array combining collinear broadside elements and parallel end-fire elements, popularly known as the W8JK array.
(Reprinted from the ARRL Antenna Book, 15th Edition, page 8-37)




| Band | S | $L_1$ | $L_2$ | $L_3$ | $L_4$ | M | D | A (¼) | A (½) | A (¾) | X |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 17' | 33'6" | 59' | 51'8" | 43'1" | 8'8" | 4' | 26' | 59' | 94' | 4' |
| 20 | 8'8" | 17' | 30' | 26'4" | 22' | 4'9" | 2' | 13' | 30' | 48' | 2' |
| 15 | 7'10" | 12'8" | 22'6" | 18'3" | 15' | 4'0" | 1'8" | 10'6" | 22' | 36' | 1'6" |
| 10 | 5'2" | 8'6" | 15' | 12'7" | 10' | 2'8" | 1'6" | 7' | 15' | 24' | 1' |

Fig 18 – W8JK array design data.
(Reprinted from the Radio Handbook, 21st edition, page 28-16)

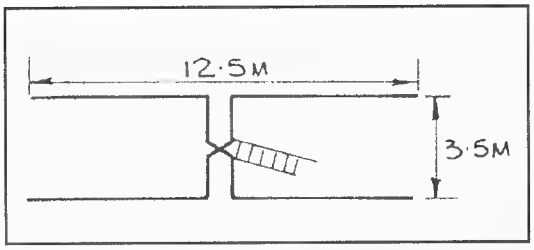



Fig 19 – A W8JK array for 10 MHz as a gain antenna, useful on various bands as follows:
10 MHz – single section W8JK with gain of 3 dB over a dipole.
14 and 18 MHz – extended half-waves for driven dipoles, for 4 dB gain.
21 MHz – driven elements equal to two half-waves in phase, for 5 dB gain.
24 and 28 MHz – driven elements equal to two extended half-waves in phase, for 6 dB gain.
(Reprinted from Amateur Radio, September 1984, page 17)

use by amateur and professional alike. This is an end-fire array in which its elements are driven, compared to the Yagi that utilises parasitic elements. The driven elements can also be collinear elements making a combination end-fire and collinear array (Fig 17). There are a number of useful features which make it attractive as a multipurpose, multiband antenna, including:

1. not as seriously influenced by height above ground as a similar sized Yagi array;
2. useful as a multiband antenna;
3. symmetrical in its construction;
4. adjustments made at the base of the feedline, not at the antenna;
5. has reasonable gain; and
6. is bidirectional

My own experience has revealed the W8JK to be a good choice for a fixed wire antenna for any location. I have also used it as a rotary beam antenna and, as such, it only requires 180 degree rotation for all-round coverage.

A number of configurations using single and double sections are possible (Fig 18). Stacking is also possible, for which an appropriate gain increase (max 3 dB) may be realised. The most successful simple version for suburban backyard use would be the single section array. With 10 metre half wave elements, and 2.5 m spacing, this combination gives 3, 4 and 5 dBd gain on 14, 21 and 28 MHz respectively (Fig 19). One other version uses two half-waves in phase, each driven, for gains of 5 dBd and 6 dBd on 14 and 21 MHz. On 28 MHz the lobes break up and, whilst having useful gain, are multi-directional.

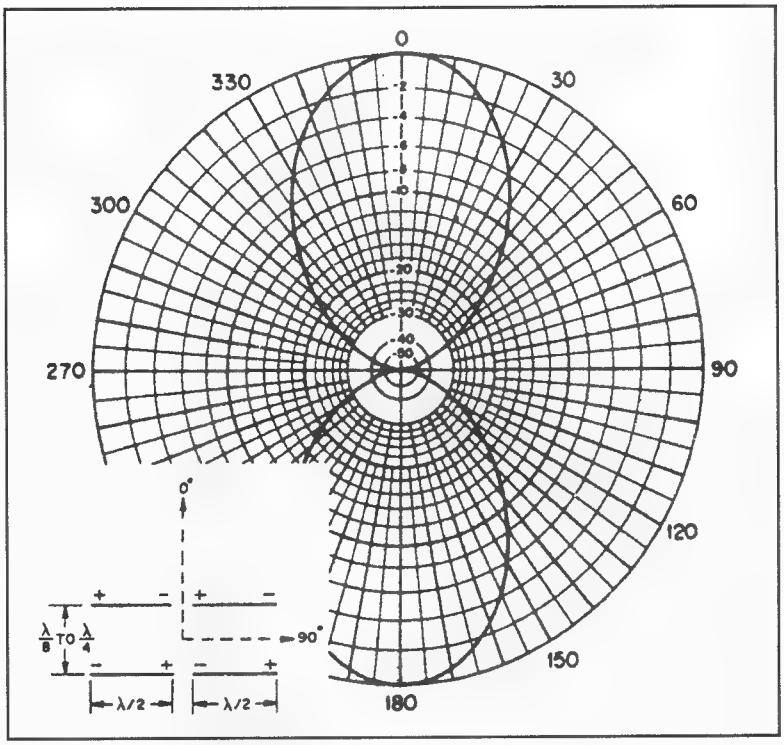



Fig 20 – E-plane pattern for the W8JK array. The elements are parallel to the 90° – 270° line in this diagram. Less than 1° change in half power beam-width results when the spacing is changed from 1/8 to 1/4 of a wavelength.
(Reprinted from the ARRL Antenna Book, 15th Edition, page 8-37)

Yet another arrangement has two extended half-waves in phase to give 6 dBd gain on 14 MHz. The lobes on 21 MHz and 28 MHz, whilst useful and possessing high gain, are in odd positions, and orientation of the antenna for directional use on 14 MHz only seems the most practical. It is not imperative that all elements be exactly a half wave as long as they are equal in length and the whole configuration is symmetrical (Fig 20).

One major advantage is the ability of the array to operate over a 2.5 to 1 frequency range and maintain the bidirectional pattern, with gain increasing as the frequency is raised. Most designs show a spacing of 1/8 wavelength, but anything between this and 1/4 wave should give good results. The array may be erected less than a halfwave above ground, provided that the symmetry of the W8JK array is maintained (ie it is sufficiently far away from nearby structures, trees, etc). It gives good results on every band from 10 to 28 MHz (as well as good reception on the various broadcast bands).

## ZL special antenna

This antenna is another version of the two element end-fire phased array (W8JK), but configured to give unidirectional radiation. The ZL Special is a popular antenna in its own right and is used mainly on 14 MHz and above as a directional beam, with 4 to 5 dBd gain and a front-to-back ratio that is greater than 30 dB. It is also used on VHF and UHF as the major driven element in a multi-element long-boom Yagi (Fig 21).

It evolved from early experiments using two dipoles, spaced 1/8 wave, and fed 135 degrees out of phase. This array (G8PO) used each dipole fed with an equal length of twin feed line, one line being transposed and fed in parallel with the other (180 degrees). A further phase shift was provided by an additional quarter wave line in one of the feedlines (45 degrees). This method of phasing can produce a number of interesting patterns, depending on the spacing and phase shift between the two elements (Fig 22).

The ZL Special uses a phasing line connected directly between the elements at the top of the mast (so, therefore, has

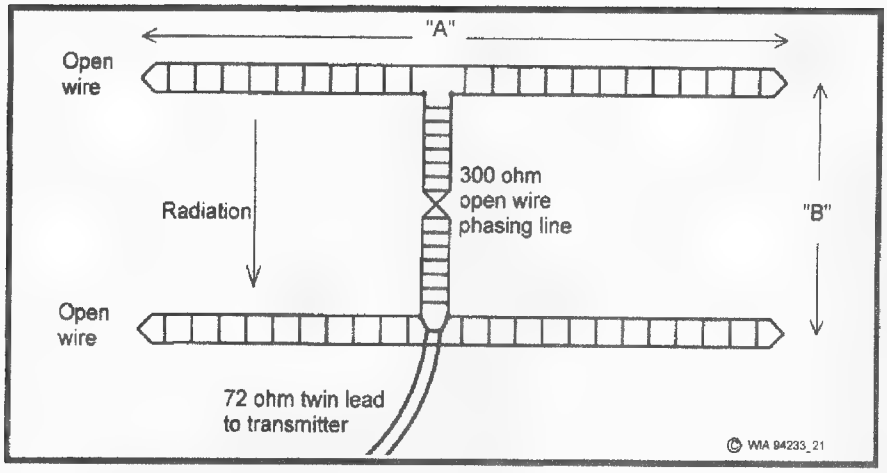



Fig 21 – The ZL-Special antenna has good gain and directional characteristics considering its overall size. For example, dimensions for 14.1 MHz are A = 31'6" and B = 8'8"

to be pre-cut to length) and only one feed line. The centre impedance is very low, being about 12.5 ohms. Matching stubs enable it to be driven by open wire lines or coaxial cable.

A similar antenna developed by HB9CV, and published in the European press, used a coaxial cable phasing line between the two elements, which are gamma matched to the diametrically opposite quadrants. This version has become very popular for VHF use as a fox hunting antenna, where its front to back ratio is extremely useful.

## Construction

The use of "plumber's delight" methods is precluded in the ZL Special by the need to have an insulator in the centre of each element. The boom may be 50 to 70 mm aluminium tube, "U" bolted on to the vertical drive pipe. If, say, a 10 metre length of 32 mm diameter aluminium tubing (with appropriate tapering) is used for the elements, and split in the middle, cambric or fibre glass rod may be used for joiners, inserted into the central tube ends, to give an insulated "split" in the elements. This need only be 150 mm long, enough to use a "U bolt" style TV clamp to hold the element on to the boom.

For 14 MHz the tube length is 10 m and the element spacing 2.1 m. The phasing line is 72 ohm twin lead, 2.46 m long, transposed, whilst matching to a 300 ohm line is by a 3.6 m length of the same 70 ohm twin lead. A version using folded dipole elements is shown in Fig 21.

VHF Construction has been well recorded in Fred Judd's (G2BCX) article, ZL Special 2 m Beam, in "Out of Thin Air", a Practical Wireless publication.

Part 3, the final of the series on 'Some Useful Wire Antennas for HF'; will appear in a coming issue of Amateur Radio.

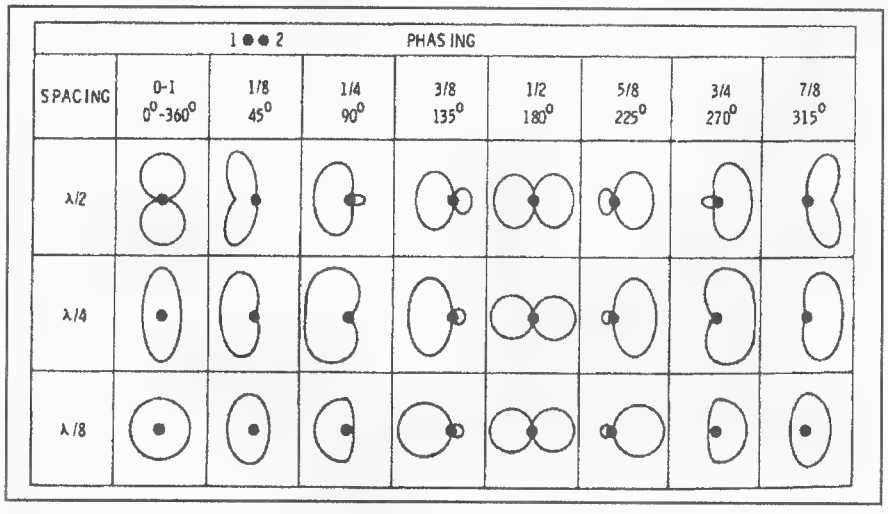



Fig 22 – Radiation patterns for a two-element phased array. (Reprinted from the Radio Handbook, 21st edition, page 27-12)

## Gain of V Beam

The author would like to make a slight amendment to Part 2 of this series. Referring to V Beams, it is stated that terminating each end remote from the feed-point with a 400 ohm resistor to ground will produce not only a unidirectional pattern but "a benefit of up to 3 dB additional gain".

On energy-conservation grounds it may be argued that absorbing some power in the resistors, which would otherwise be radiated in a particular direction, cannot increase the power radiated in another direction. The front-to-back ratio will become large, but to expect further gain (approaching 3 dB) is rather optimistic. It may be, because in the terminated case the current distribution along the wires is a travelling wave, not a standing wave, that the energy-conservation concept is an over-simplification and some additional gain may in fact be possible; but it is likely to be much less than 3dB.

**ar**

## Amendment

### VK5BR X Antenna

### Figure captions omitted November 2004 pages 15-17

I have to apologise to Lloyd Butler VK5BR for the omisson of the captions from his article. If you want to insert them in your copy for completeness they are given below.

**Editor VK5UE**

Figure 1 - VK5BR_X2/X3 Antenna Field
Figure 2 - VK5BR_X3 Antenna
Figure 3 - Tuning arrangement VK5BR_X2 Antenna
Figure 4 - VK5BR_X3 Antenna Shunt Feed Coupling System
Figure 5 - VK5BR_X3 Antenna Coil Connection

# An experimenter's LF/MF receiver

Dale Hughes VK2DSH

**The idea for this receiver grew out of an article by Lloyd Butler, VK5BR, in the December 1989 issue of Amateur Radio. The article (1) described a LF/MF receiver which used a resistance tuned local oscillator and operational amplifiers for the gain stages. The design was appealing because of its simplicity and ease of alignment, and the resulting receiver was small enough for portable use.**

My initial intent was to duplicate the receiver, however several of the crucial parts appeared to be difficult to obtain. I then realised that this presented an opportunity to try out some circuit techniques that might be interesting, these being:

- A local oscillator using Direct Digital Synthesis (DDS) technology. I had recently been experimenting with DDS technology in a test oscillator (2) and was confident that a DDS design would work very well. An accurate 50 MHz crystal oscillator module that provides a high degree of frequency stability and resolution clocks the DDS. In this design, a frequency step of 100 Hz has been provided.
- RF amplifiers using 'noiseless feedback', where gain stabilization is by means of transformer coupled negative feedback. This circuit topology is reputed to have excellent signal handling ability, wide bandwidth and a low noise figure. It also has the advantage of presenting a 'two way impedance match'; that is, the input impedance is the same value as the output impedance. In this case, the impedance is 50 ohms. These features come at the cost of increased power consumption. Details of 'noise-less feedback' amplifiers can be found in references (3), (4) and (5). The amplifier used in this receiver is a push-pull design that performs very well, giving a voltage gain of approximately 9, and handling the high signal levels found in the low and medium frequencies with ease.
- A switching type mixer based on a CD4066 CMOS analog switch driven by a 74HC74 flip-flop that generates an accurate square wave. The mixer is broadband terminated by a differential input, high frequency operational amplifier.
- The detector is a so-called 'supergainer' regenerative detector (6) that can give considerable gain, up to the point of positive feedback. When oscillating, the detector performs well as a CW and SSB demodulator. Prior to the onset of oscillation, the detector acts as a standard 'square law' envelope detector.
- Use readily obtainable operational amplifiers for the IF stage.
- Use an 'Active Whip' type antenna, that is a short vertical element with an impedance converter which converts the high impedance of an electrically short whip to the 50 ohm input impedance of the receiver. References (7), (8) and (9) provide some background in the techniques used for active whip antennas and several different designs are discussed. The most important factor in the design of active whips is dynamic range and noise figure.

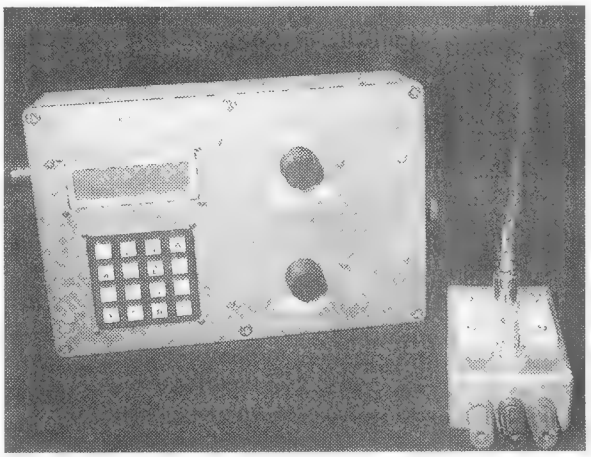


Figure 1. The complete receiver and the portable version of the active whip antenna.

The final design of the receiver uses all of the above ideas and the result is a receiver that has the following specifications and features:

- A frequency range of 10 kHz to 2000 kHz, in 100 Hz steps,
- Excellent dynamic range,
- Low noise,
- High sensitivity,
- Demodulates CW, SSB and AM,
- Adjustable RF step attenuator,
- Easy to use and portable.

The receiver is easy to operate, with a minimum of controls. Frequency selection is by means of a keypad, where the frequency can be entered directly. The keypad also allows the user to step up or down in frequency in 100 Hz steps. The RF attenuator is also adjusted from the keypad, the user can select one of four attenuator settings: 0 db, 6 db, 12 db or 18 db. The only other controls are the volume control and the regeneration control. The regeneration control gives the user control over the detector gain and increasing the regeneration can significantly enhance weak signals. CW and SSB signals can be resolved by advancing the regeneration control up to the point of oscillation where the detector becomes a self-oscillating product detector. In use, the control is very smooth and the detector gives a very high quality audio output. In addition to the foregoing, when receiving a strong AM station, the detector can act in an 'injection locked' mode, where the oscillating detector will lock to the incoming carrier. The

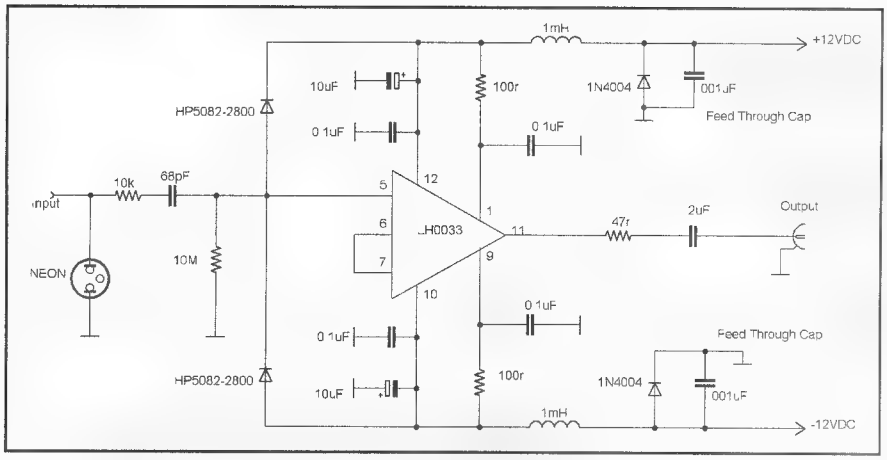



Figure 2. Active antenna schematic diagram

detector performance is very good in this mode, with noise and distortion at a very low level.

The receiver sensitivity is as good as it needs to be, DX AM broadcast stations are easily received. In the LF region, NDBs over 1200 km distant have been heard and the time signals on 40 kHz and 60 kHz are heard most evenings. The 60 kHz signal can only be heard if the receiver is well away from any television set, as a harmonic of the 15625 Hz line oscillator will completely swamp the 60 kHz time signal. Reception down to 10 kHz is possible and the Russian 'Alpha' navigation signal can occasionally be heard, as can the various naval transmissions below 25 kHz.

The step attenuator is useful when receiving a weak signal adjacent to a strong signal, and the receiver noise figure is low enough to permit using the maximum attenuation (18 db) setting to overcome any overloading problems. As the receiver has no AGC system, the step attenuator can be used in conjunction with the regeneration control to reduce the volume of powerful stations.

This article should be considered more as a description rather than a detailed construction article, thus no printed circuit board artwork is given and some of the parts used might be difficult to obtain. The original receiver was built on 'Vero' type prototype boards, or using 'ugly' type construction. When the design was more-or-less complete, circuit boards were designed and made. Even then, changes were made to the final circuit as receiving experience dictated circuit modifications.

Due to the presence of high-speed digital circuitry in the micro-controller it is very important that special attention is paid to filtering and de-coupling of all power supply and control lines. The completed receiver makes extensive use of feed-through capacitors on all power supply connections, relay control lines and audio circuits. In addition, the RF circuitry is well screened from the digital circuitry by two layers of thin circuit board material. Inadequate screening, filtering and mechanical construction will result in inferior performance of the completed receiver.

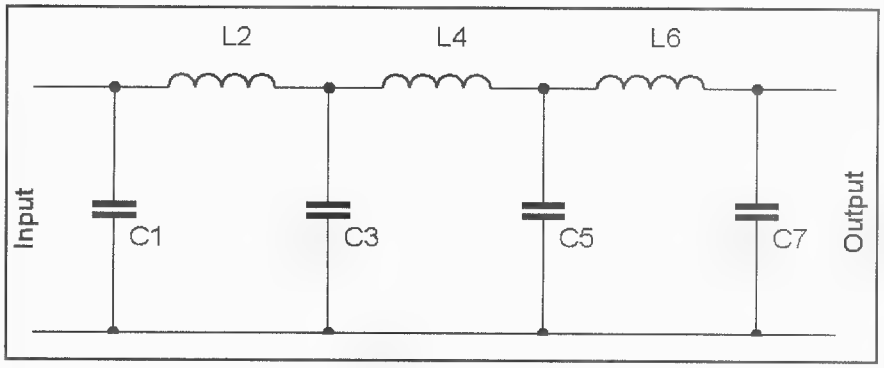



Figure 3. Prototype filter schematic diagram. The front end requires four such filters with the component values shown in Table 1. (See figure 4.)

## Detailed circuit description

The receiver can be broken down into a number of sections:

(1) The active antenna,
(2) The 'front end' filters, attenuator and RF amplifier,
(3) The mixer, IF, detector and audio amplifier,
(4) The DDS local oscillator.

Each of these parts will be described in the following sections.

Note that the supply to the receiver is split, i.e. +/- 6 volts, this simplified biasing of the operational amplifiers in the IF and DDS sections. The active antenna uses a split 12 Vdc supply, i.e. +/- 12 volts, and it can be run from the +/- 6 volt supply if required, although the dynamic range of the buffer is reduced and the potential problems due to overload and inter-modulation are increased.

## The active antenna

As the antenna is a short vertical whip it is necessary to employ some form of impedance matching between the whip, which has a very high impedance, and the 50 ohm feed line. This design uses a LH0033 FET input, fast voltage follower that has a very high input impedance and a line driver output stage. The active antenna module is fitted with lightning protection in the form of a neon tube between the antenna input and ground, the buffer input is protected by reverse biased diodes which conduct when the input voltage exceeds +/- 12 Vdc, a series resistor limits the transient current flow to a small value. Two of these units have been built, a roof-mounted unit with a 1.5 m whip and another portable unit with a shorter, telescopic antenna and no lightning protection. (As shown in figure 1.)

Inter-modulation products can be a problem with active antennas, especially in areas where there are multiple high power transmitters. This design is reasonably robust as the standing current of the FET stage is 10 mA, and the supply voltage is +/- 12 Vdc,

This results in a buffer that handles high-level signals without generating significant inter-modulation products. The output impedance of the complete active antenna is 50 ohms, so it presents a good match to the following low pass filters. Shunt capacity on the antenna

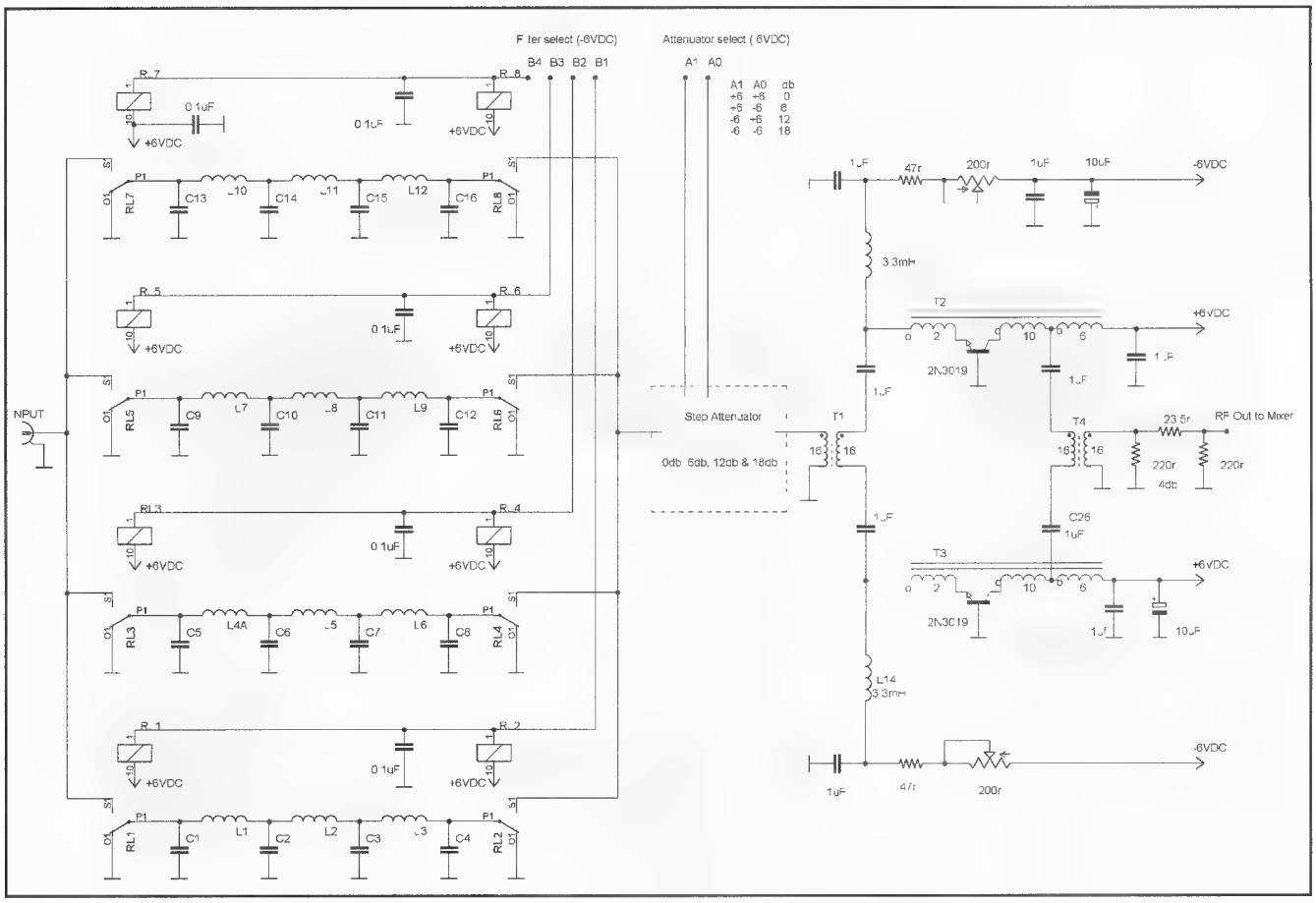



Figure 4. Front-end schematic diagram. The low pass filter component values are taken from Table 1. Transformers T1, T2, T3 and T4 are wound on Amidon FT-50-77 ferrite cores. See figure 5 for details of the step attenuator.

input should be keep to a minimum if reception down to the lowest frequencies is required.

## The front end

As the receiver is a superhet design, some form of image frequency rejection is required. A conventional receiver would use a tuned circuit that would reject the image response 910 kHz (twice the intermediate frequency) above the wanted frequency; such a system is easily achieved when a multi-ganged variable capacitor is used. In this design there is no variable capacitor so it was more difficult to arrange a variable frequency tuned circuit. Instead this design uses a low pass filter, which is selected according to the frequency of interest. In this case, the low pass filters have cut-off frequencies of 365 kHz, 663 kHz, 1210 kHz and 1960 kHz. The filters are 7 element designs taken from the ARRL handbook (10) and have been selected to use standard capacitor values and hand wound toroidal inductors. Table 1 shows the component values and cut-off frequencies; figure 3 shows the prototype filter design and component identification.

Where n is the number of turns on an Amidon T50-15 toroidal core (Iron powder type core). Fc is the filter cut off frequency, F40 is the frequency at which the filters response is 40 db down

The required filter is switched into the signal path by means of small relays, I considered using diodes to switch the filters into and out of the signal path, but was concerned that diodes might be subject to high signal levels and a potential source of inter-modulation products. Each filter section is short circuited when it is not selected so that spurious filter resonances should not occur. Software examines the selected receive frequency and switches in the appropriate low pass filter. The user has no direct control of the filters.

A constant impedance step attenuator follows the filters and the signal level entering the RF amplifier can be adjusted to suit the listening conditions, four levels of attenuation are possible 0 db, 6 db, 12 db and 18 db. Control of the attenuators is by means of key strokes on the keypad. Details of the attenuator are given shortly.

The RF amplifier uses a pair of 2N3019 transistors in a push-pull noiseless-feedback arrangement. This circuit has the advantage of being able to handle very high signal levels and still operate in a linear region. The circuit has 50 ohm input and output impedances and is well

| $F_c$ kHz | $F_{40}$ kHz | $C_{1,7}$ nF | $C_{3,5}$ nF | $L_{2,6}$ uH | $L_{2,6}$ n | $L_4$ uH | $L_4$ n |
|---|---|---|---|---|---|---|---|
| 365 | 580 | 10 | 18 | 31.1 | 48 | 34.5 | 51 |
| 663 | 1050 | 5.6 | 10 | 17.5 | 36 | 18.9 | 38 |
| 1210 | 2130 | 2.2 | 4.7 | 9.27 | 26 | 10.8 | 28 |
| 1960 | 3140 | 1.8 | 3.3 | 5.83 | 21 | 6.5 | 22 |

Table1. Component values for front end low pass filters.

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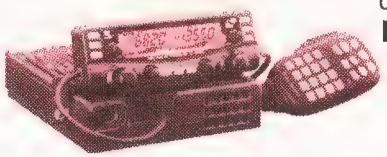

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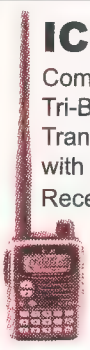

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suited for use in the LF/MF frequency range. With appropriate transformers and transistors, the circuit will operate well into the VHF range. The gain of the circuit is set by the turns ratio of the feedback transformers (T2 and T3) and with the values shown, the circuit has a voltage gain of 9. The 4 dB attenuator at the output of the amplifier is necessary to preserve the high dynamic range of the RF amplifier, as it ensures that the RF amplifier termination impedance is correct.

The bias current is adjusted by means of the 200 ohm potentiometer in the emitter circuit, so that 20 mA of collector current flows in each transistor. Ideally, the transistors would be well matched, however I did not match the transistors and I found that the gain of each 'half' of the circuit was very close. Other suitable transistors would be 2N3866 or 2N4427 devices, depending on availability.

As the ferrite toroidal cores used in the amplifier are conductive it is best to insulate the core with Teflon tape or to use insulated wire; I used wire wrap wire, also known as 'Kynar' wire to wind the transformers. For the inductors in the low pass filters I used enameled copper wire directly onto the painted iron powder cores.

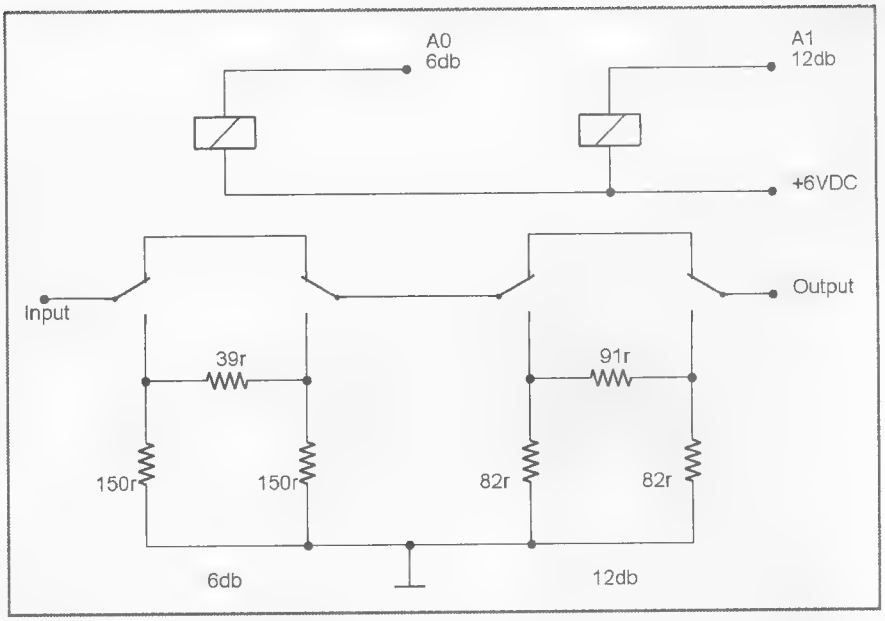


Figure 5. Schematic diagram of the step attenuator between the output of the low pass filters and the RF amplifier input. Other values of attenuation can be used if required.

The attenuator was built on a small circuit board mounted adjacent to the front-end board and the signal coupled via thin co-axial cable. The relays are


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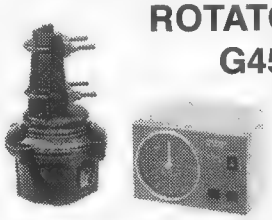

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switched according to the level of signal attenuation required:

| Attenuation (db) | Relay A0 | Relay A1 |
|---|---|---|
| 0 | Off | Off |
| 6 | On | Off |
| 12 | Off | On |
| 18 | On | On |

Table 2: Attenuator relay selection.

Selection of the attenuator setting is via the keypad. When the * key is pressed, a menu appears on the LCD and the user can select which level of attenuation is required. The current setting of the attenuator is always displayed on the LCD, along with the current receive frequency.

## The mixer, IF and detector stage

Following the front end, the signal is passed to the mixer where the 455 kHz IF signal is generated. The mixer is a double balanced design using four analog switches. The switches are driven by a 74HC74 D-type flip-flop that provides an accurate square wave. A Schmidt trigger converts the sine wave output of the DDS oscillator to a logic level signal to drive the 74HC74. The mixer output is terminated by a resistive load by way of the input resistors of the following op-amp (IC4) that converts the balanced output of the mixer to a single ended signal and provides a modest amount of gain.

The ceramic filter that follows the mixer amplifier sets receiver selectivity. The filter I used has a 6 dB bandwidth of +/-3.5 kHz, which is wider than desirable, but it was the only filter I had on hand. Following the filter is an amplifier (IC5) that also provides the correct termination impedance for the filter.

As the receiver was designed to receive CW and SSB as well as AM signals, some sort of BFO was required. After examining the literature, I settled on the 'super gainer' type design that combines an envelope detector as well as an oscillator. When receiving AM, the gain of the circuit is adjusted such that no oscillation occurs. For receiving CW or SSB, the regeneration control is advanced until a beat note is heard. The gain of the stage also changes with the amount of regeneration, for strong signals the regeneration control is

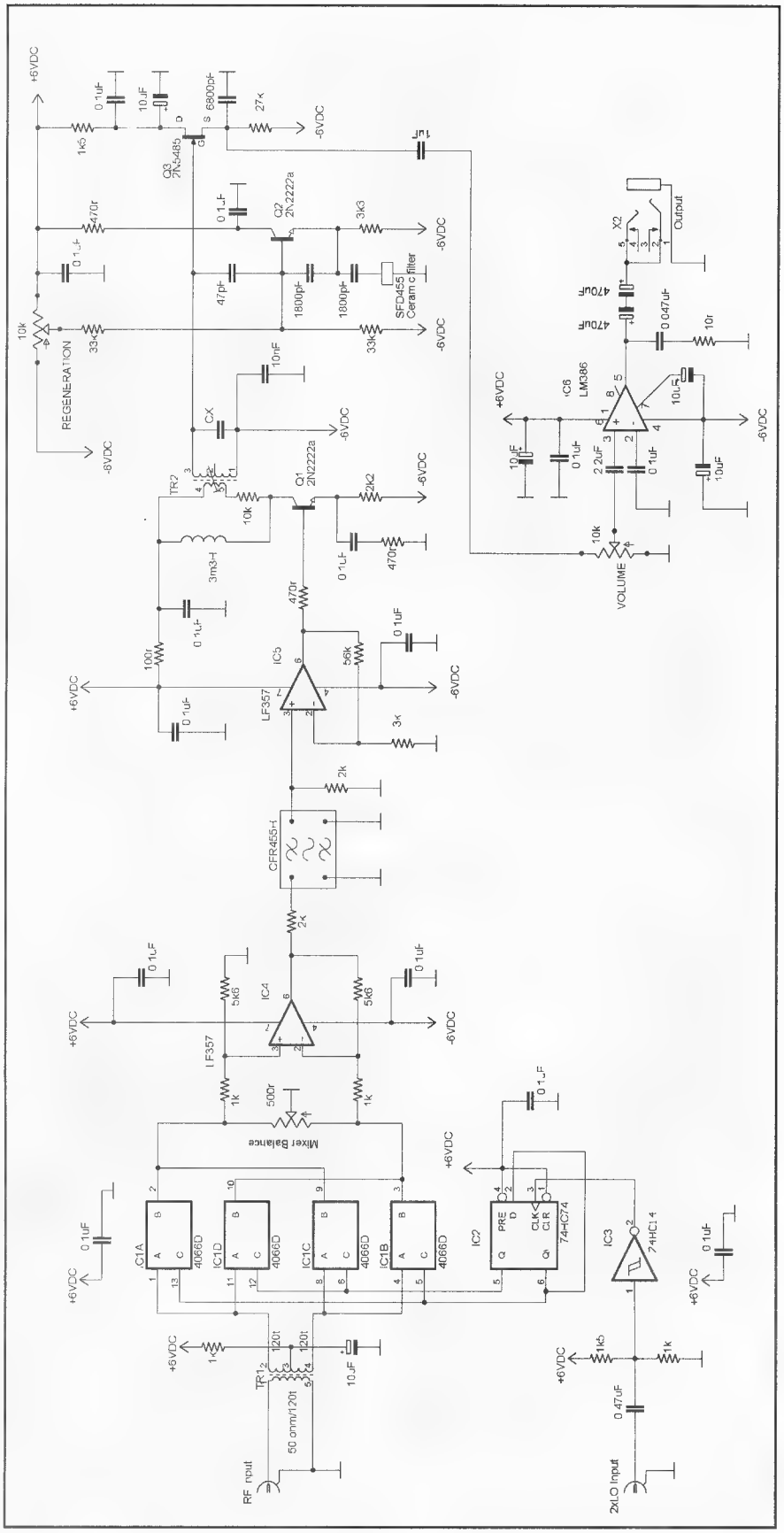


Figure 6. IF and detector schematic diagram.

backed off, maximum sensitivity occurs just prior to the onset of oscillation. The circuit performs very well and the regeneration control provides a wide range of gain adjustment and a smooth transition into and out of oscillation. The schematic diagram shows a two terminal ceramic filter (Murata type SFD455) in the emitter circuit of the oscillator transistor (Q2). This device acts to stabilize the oscillation frequency of the stage and is optional, if not used it should be replaced with a short circuit.

Transformer TR2 is a standard miniature 455 kHz IF transformer, (Cx is internal to TR2) and the output from the final IF amplifier (IC5) is lightly coupled to TR2 using a 10 k ohm resistor. Reducing the value of the coupling resistor makes the regeneration control much less effective, as the tuned circuit will be more heavily damped.

A LM386 audio amplifier has a voltage gain of 50 and will drive a loudspeaker or headphones with ample volume. As there is no Automatic Gain Control it is necessary to be careful when using headphones for listening, as it is possible to tune from a weak station to a strong station with ear-splitting results!

## The DDS local oscillator and micro-controller

A Direct Digital Synthesizer is used as the receiver local oscillator. The DDS local oscillator runs at twice the mixer frequency due to the divide by two flip-flop on the IF board. Thus the DDS frequency is:

Flo = 2 (Frx + 455) kHz

Where Flo = Receiver local oscillator frequency

Frx = Receiver frequency

For this receiver the DDS oscillator tunes between 930 kHz and 4910 kHz, as the tuning range is 10.0 kHz to 2000.0 kHz, the required frequency is entered via the keypad and is displayed on the liquid crystal display. An Analog Devices AD 9835 DDS was used, and this chip has a maximum output frequency of 25 MHz when a 50 MHz crystal oscillator is used as the reference frequency. The sine wave output from the DDS chip is amplified by an LM7121 op-amp. The DDS signal is subsequently squared by a Schmidt trigger on the IF board, where the local oscillator signal is divided by two to generate the correct local oscillator frequency.

Control of the DDS, LCD, keypad and relay switching is by means of an Atmel AT90S8535 micro-controller. This chip is a very powerful and easy to use device, readily available from Dick Smith Electronics at reasonable cost. The micro-controller chip controls the input filter selection and attenuator relays and the interface is via a network of feed-through capacitors and opto-couplers. The opto-couplers provide a high level of electrical isolation so that noise from the micro-controller and associated circuitry is not coupled into the receiver. The opto-couplers also allow the 12-volt relays to be controlled from the 5-volt micro-controller circuitry. The opto-couplers used in this design have a high current transfer ratio (100%). If opto-couplers with a lower current transfer ratio are used, driver transistors will be required so that the relays pass sufficient current to operate.

The current version of the micro-controller firmware allows operation of the receiver between 10.0 kHz and 2000.0 kHz, and the frequency can be selected in 0.1 kHz increments. When a frequency has been entered, the setting can be incremented or decremented in 0.1 kHz steps by using 'up' and 'down' keys on the keypad. Thus, it is very easy to fine-tune the receiver.

The DDS and micro-controller are mounted on the same printed circuit board that is mounted on top of the box behind the keypad and display. These components are covered with a screen to minimise interference. All signal and power lines, except the local oscillator output, are filtered using feed-through capacitors. The local oscillator output is connected via small diameter coaxial cable.

The power supply regulator, DDS/micro and opto-isolators are on separate circuit boards, and mounted on the front panel of the receiver box – suitably screened.

## Receiver adjustments

There are a number of components that require alignment after the receiver is constructed:

- Adjust the micro-controller and DDS power supply to 5.00 Vdc by adjusting the potentiometer on the LM2941 voltage regulator.
- Adjust the contrast control so that the liquid crystal display can be clearly seen.


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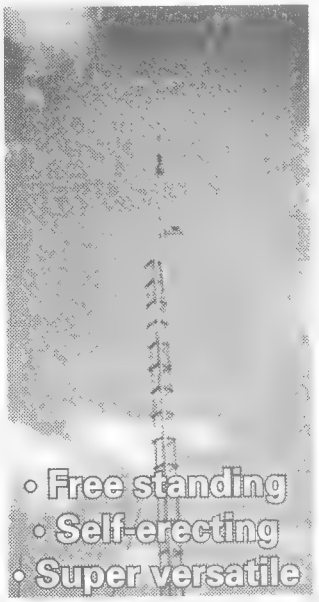


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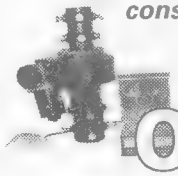

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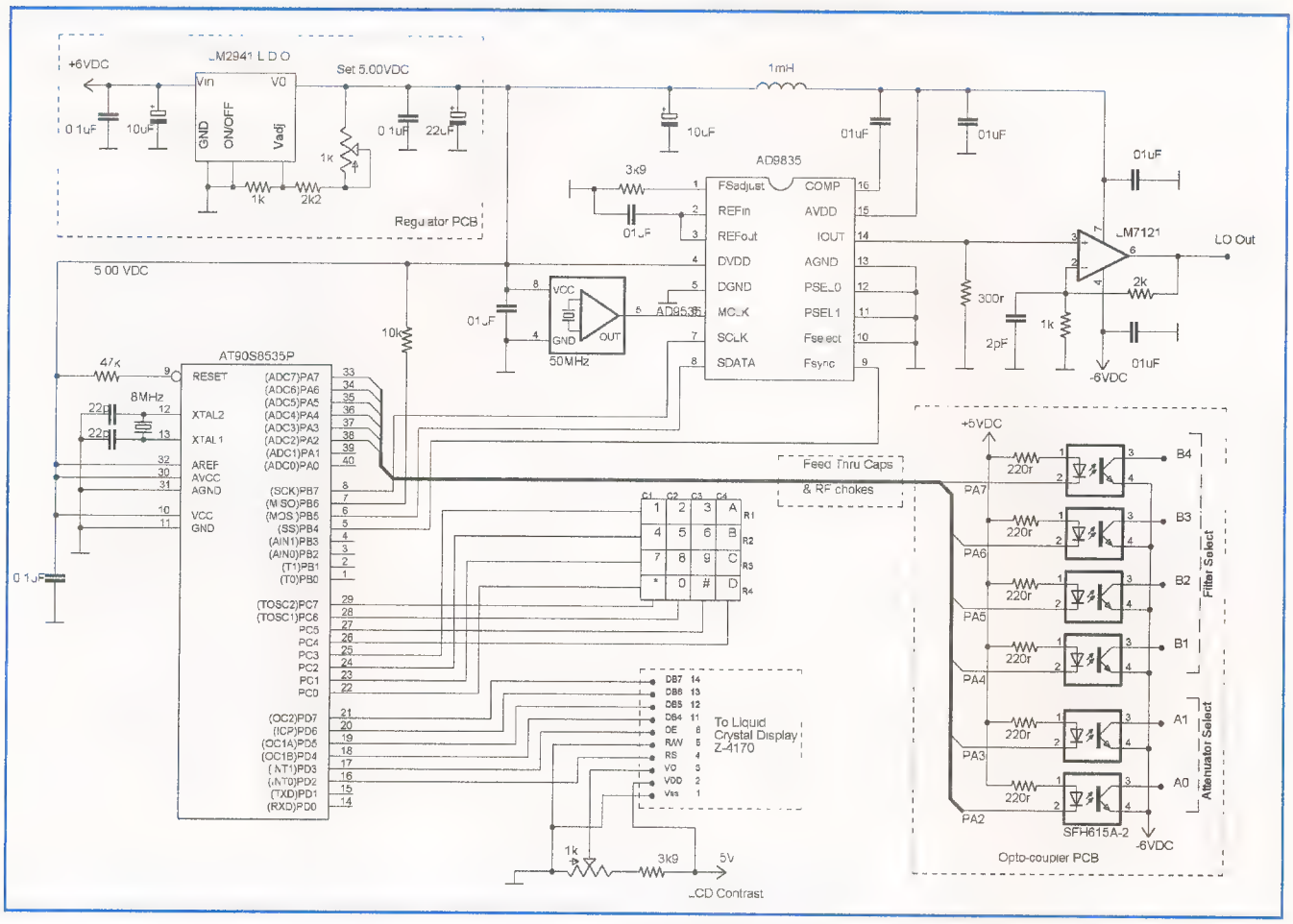


Figure 7. DDS and micro-controller schematic diagram.

- Adjust the 200 ohm potentiometers in each of the RF amplifier circuits so that an emitter current of 20 mA is obtained. This is best done by measuring the voltage across the 47 ohm emitter resistor and adjusting the control until 0.94 volts is measured across the resistor.
- Set the mixer balance control to mid way through its travel. Connect an oscilloscope to the output of the mixer amplifier (IC4). With the receiver input terminated with a 50 ohm load, adjust the mixer balance control so that the noise level measured on the oscilloscope is minimized. The mixer is balanced when this is done.
- Tune the receiver to a weak signal, or inject a weak signal, at approximately 1 MHz. Set the regeneration control to minimum, then adjust the core in the IF detector transformer (TR2) for maximum audio output.

## Receiver performance

The receiver performs very well and is easy to use; the DDS gives drift free and repeatable performance. Due to the use of a strong RF amplifier using 'noiseless' feedback, the receiver performs well in the presence of many strong signals. Using the step attenuator to control signals levels into the RF amplifier is essential if best performance is to be obtained.

As the detector is regenerative, its bandwidth can be somewhat narrowed by increasing the regeneration, but better selectivity could be obtained by using a filter with a narrower bandwidth. However, this does not cause any problems in the use of the receiver. As mentioned previously, the quality of the audio output is very good for both AM and CW signals, and medium wave DXing is a lot of fun with this receiver.

Sensitivity appears to be quite adequate, with LF aeronautical beacons being heard over distances up to 1500 km and standard time stations on 40 and 60 kHz being easily heard if atmospheric noise is low enough. The limiting factor appears to be locally generated interference from TVs, computers and the like. At a quiet location away from such noise sources, worldwide reception is possible i.e. reception of JJY from Japan and the Russian signals.

No image responses are possible when using the receiver below 455 kHz as the receiver is working in the 'up-conversion' mode and the low pass filter attenuates the image frequencies. When tuning above 455 kHz image frequency responses are possible due to the broadband input, however the low pass filters and switching software have been selected to minimise these responses.

The disadvantage of using a broadband input is evident when using the receiver above about 1500 kHz. Intermodulation products and noise are apparent and the use of an appropriate band pass filter would be necessary for any weak signal reception.

## Components

There are a number of parts in this receiver that may be difficult to obtain from the usual sources: the IF filter I obtained from a junked receiver and similar filters can be found without too much trouble. The LH0033 buffer had been purchased many years ago for another project and other amplifiers can be substituted, particularly high-speed video amplifiers. The main considerations are noise figure and signal handling capability. Discreet component designs can also be used and the references given provide several options.

The relays used for filter selection and the attenuator are small signal type relays obtained from Altronics, catalogue number S4130. Other relays can be used if required.

The Atmel AT90S8535 micro-controller is available from Dick Smith Electronics, catalogue number Z9205.

The Analog Devices AD9835 DDS is available from Farnell, catalogue number 334-3042.

The rest of the parts are readily available. As none of the remaining parts is very specialised, substitutions are possible and higher receiver performance may result if wise substitutions are made. It's all about experimenting!

## Conclusion

The design of a receiver using a number of uncommon techniques has been presented, the receiver offers very reasonable performance and the design should be readily duplicated by an advanced experimenter. The references cited give a good overview of the techniques and make interesting reading.

I hope that the ideas presented in this article might encourage others to attempt such projects. I would be more than happy to hear from other experimenters who are trying similar ideas.

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(10) *Filter selection tables*, ARRL Handbook 1999. P30.18


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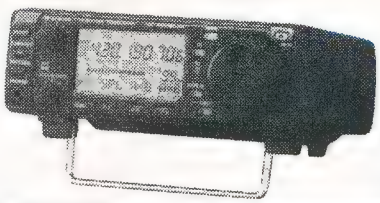

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AR/7/4

# NCDXF/IARU beacon wheel for Around the world in 3 minutes

Christoph Berg DF7CB (df7cb@darc.de), translated and adapted by J.C. (Jack) Laib VK6CTL

**The Northern California DX Foundation (NCDXF), together with the IARU, has built up a network of propagation beacons strategically located around the world. Eighteen beacons transmit in sequence on 14, 18, 21, 24 and 28 MHz.**

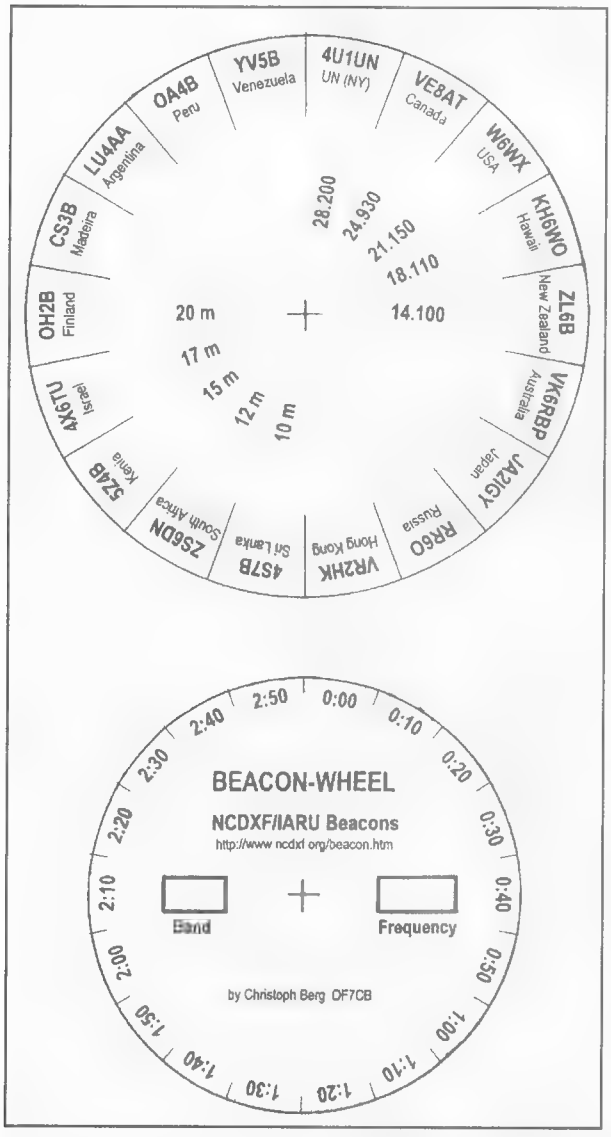
Each beacon transmits its call sign in CW followed by four ten second dashes of 100, 10, 1 and 0.1 watt. The beacon transmissions follow a fixed sequence that repeats every three minutes.

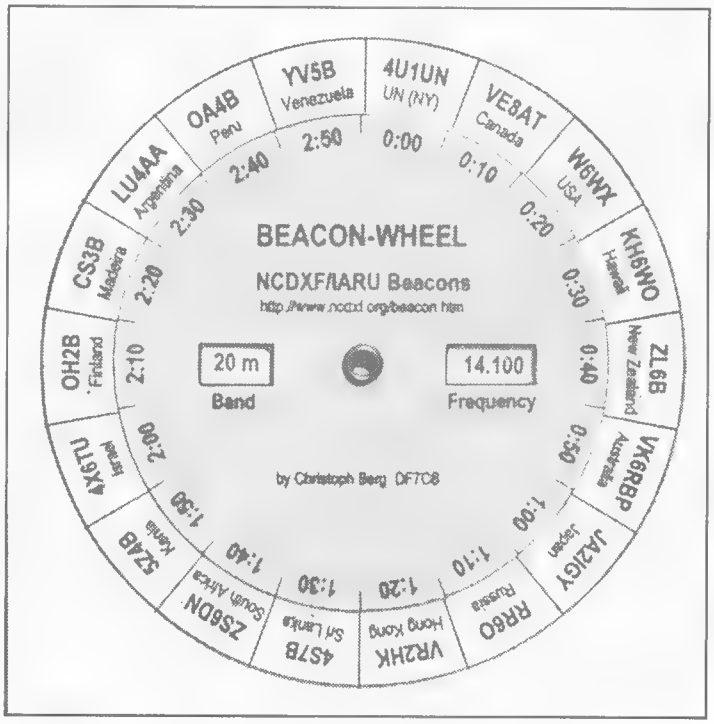
As these beacons transmit on the same frequency on each band it saves the trouble of chasing various beacons for a precise assessment of present propagation conditions. Every beacon transmits first on 14 MHz then after three minutes on 18, then on 21, 24 and 28 MHz.

Knowing the sequence of these beacon transmissions gives you the ability to determine the actual propagation conditions around the world on the five higher frequency bands. The four dashes in 10 dB steps give you a measure of signal strength to be expected and an indication if QRP contacts may be possible. Since each dash is 10dB lower than the previous one the signals can also be use to check your S-meter calibration.

A table of the beacon frequencies, together with their transmitting sequence, may be found in the WAI Yearbook or may be downloaded from the web page of NCDXF (www.ncdxf.org/beacon.htm). Software can also be downloaded that shows graphically which beacon is currently transmitting.

This cyclic pattern of beacon transmissions gave DF7CB the idea to develop a 'beacon wheel'. It is very easy to use and available at any time. The usage should be familiar to any



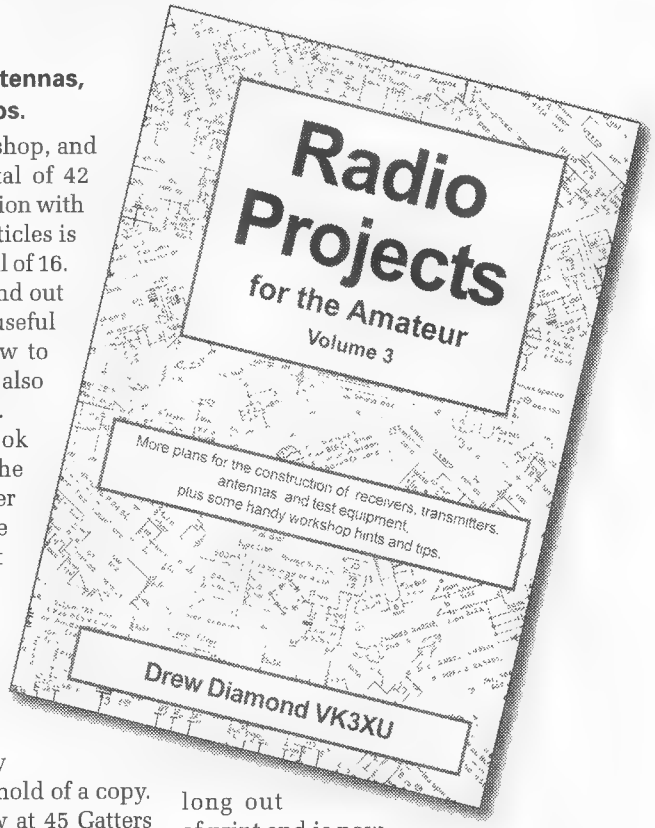
# Book Review

Ron Fisher VK3OM

# *Radio Projects for the Amateur* Volume 3

## by Drew Diamond VK3XU

**More plans for the construction of receivers, transmitters, antennas, and test equipment, plus some handy workshop hints and tips.**


Radio Projects
for the Amateur
Volume 3
More plans for the construction of receivers, transmitters, antennas and test equipment, plus some handy workshop hints and tips.
Drew Diamond VK3XU

The title and sub-title above sum up the contents of this new book by Drew. However, you will need to obtain a copy and read it yourself to really appreciate the breadth of information that it contains. In short, there is something for every amateur regardless of which aspect of amateur radio you might have an interest in

This year, editing, typesetting, layout and production has been done by Bill Roper VK3BR with a very noticeable improvement in the presentation standard of the book. Reproduction of both print and photos is very much clearer than previous volumes.

Of course, if you are a regular reader of Amateur Radio magazine, you will be familiar with Drew's articles and with his inimitable style of presenting construction projects. This book contains many of the projects that have been published in Amateur Radio since Volume 2 came out in 2001. There are also updates of earlier articles plus several brand new ones that have yet to appear in Amateur Radio magazine.

So, let's have a closer look at Volume 3 to see what it contains.

The contents are divided into seven sections as follows: power supplies, receivers, transmitters, antennas, test equipment, in the work shop, and accessories, giving a total of 42 separate articles. The section with the greatest number of articles is test equipment with a total of 16. Here you will not only find out how to construct many useful instruments but also how to use them in the shack and also around the antenna farm.

In short, this is a book for the home brewer, the prospective home brewer and the armchair home brewer. It just might convert the latter two groups into getting out the soldering iron and enjoying the wonders of building your own equipment.

Now that you are ready to go, here is how to get hold of a copy.

First, direct from Drew at 45 Gatters Road, Wonga Park, Victoria 3115. Copies are also available from the NSW WIA Book shop, PO Box 9432, Harris Park, NSW 2150. Price from both of these sources is $25 including postage.

Drew also tells me that he has a limited number of *Radio Projects* Volume 2 available also at $25 posted. Volume 1 is long out of print and is now a collectors item, but Drew says that if there is enough interest he will consider organising a reprint. Contact Drew for more information.

Thanks to Drew for another top effort with Volume 3 of Radio Projects for the Amateur.

## NCDXF/IARU beacon wheel *continued*

Ham having used a similar wheel for calculating mileage and costs of his car.

Rather than use the wheel images directly from the magazine, copy it to 220 – 400 g/m$^2$ cardboard. If you want you can use a scanner or photocopier to enlarge it to make it easier to read. Another suggestions is to copy one disk onto a different pastel coloured card and have them laminated to prolong the wheel's life.

You may also download the drawings, ready for printing, from the web page of DF7CB (www.wjp.cs.uni-sb.de/~cb/wheel/rad.html). Cut out the wheels and the two windows 'Band' and 'Frequency' from the smaller disk. Fasten the two disks in the centre using an eyelet or snap fastener from your XYL's sewing kit.

The usage is very simple: turn the inside wheel to the desired band. In the window "Frequency" you read the beacons transmit frequency. The transmission sequence of the beacons follows in a clockwise direction on the outer scale.

The indicated time on the inner disk repeats very 3 minutes. For example, 1:10 on 15 m for VK6RBP might mean e.g. 15:01:10, 15:04:10, 15:07:10 and so on. You can easily follow the beacons around the world and observe possible propagation and signal strengths on any of the five bands. Whilst the beacon chain is generally very reliable they are occasionally absent for maintenance so an inaudible beacon does not necessarily indicate a lack of propagation to that area. Inactive beacons are usually indicated on the NCDXF web site.

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# The Honduras experience

Judy MacDonnell VE0JAM

**The International Health Service is a non-profit organisation, which provides health care for the people of Honduras. While we were visiting in the USA, my husband Bob and I heard that radio operators were needed for the February mission and decided to go along.**

The flight from Houston to San Pedro lasted two and a half hours, on Friday February 13th. We passed through the foggy blue of the Gulf of Mexico and down the coast of Belize, watching boats criss-crossing the reefs and river deltas like tiny comets. Soon the swirling turquoise water gave way to the steamy green haze of the country of Honduras and we were landing.

This was the twenty-third year for IHS in Honduras, and our first. The Gran Hotel Paris in La Ceiba throbbed with the excitement of participants greeting each other and being organized into teams.

The mission was roughly divided into two wheels, with Puerto Lempira (PLP) the hub of the Miskito region and La Ceiba the hub of the other (and the administrator of both). Scattered around the rim of each wheel were remote communities, which we were to service with medical, surgical, dental and eye care.

Bob and I had been appointed to the Miskito region. We were part of the PLP logistics team, with the teams of Tipi Mona, Wauplaya/Warunta, Uhi, and Rio Kruta in its charge. There were six of us—the team leader, a Spanish interpreter, two resident pilots, Bob (radio operator/engineer) and me (radio operator/general helper).

Bob and ten others flew ahead with the advance team on Saturday morning to set up the radio gear and living quarters and segregate the container shipment of our cargo by teams. On Monday morning, after a weekend of orientation, the rest of us in the Miskito group were ready to join them. We scrambled aboard the C130, a 'Hercules' military transport plane. Large areas of its lining had been patched with duct tape. The seat backs were cargo netting and the rear of the plane was an open area, where our luggage and some cargo were held in place with straps and nets. As the engines revved for takeoff, those who had earplugs used them.

A large crowd of children and adults met us on the airstrip at PLP. We unloaded personal gear and hundreds of boxes, colour-coded for the various teams, onto the pick-up, which ferried

Photo 1. One of the small airplanes used to transport patients

Photo 2 - Radio station in use at Puerto Lempira base

everything to the Catholic compound. This was to be the base for the outlying teams and our home for the next two weeks.

PLP is a small waterside town, with a mixture of modest but well-kept homes and teetering wooden shacks. Many a family lives in a high-built wooden house with one set of steps at the front door and none at the back. It's easy to see why children suffer fractures or die when they fall from their houses. The roads are clay with potholes that look like moon craters, which are filled with water after heavy rain. It was a challenge to our team leader to find the easiest and most comfortable route when driving surgical patients between the hospital and the airstrip.

The PLP surgical team was also based at the Catholic compound and operated in the small hospital in town. We three women shared the girls' dorm at one end of the building and the men slept in a large dorm at the other end. The men's dorm also housed the radios, which were powered by electricity when the generator was on (about fifteen hours a day) and by a 12V battery when it was not. We hand-pumped water for showers and drinking, used composting toilets, and were fed each night by a local cook and his family, who brought the ready-cooked food up to the dining room. Vultures circled overhead continually, but did not match the numbers of mosquitoes and cockroaches that swarmed in the latrines during the night.

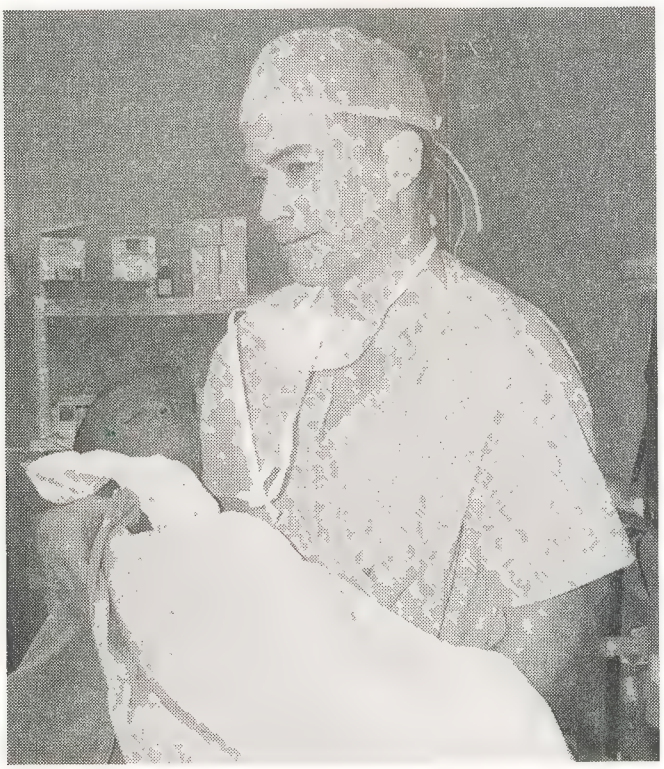

Photo 3 - A small patient leaving surgery


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Photo 4 - TRAM aerial and rig going up over Puerto Lempira

Radio communications involved hand-held GMRS radios and amateur band HF and VHF. The surgical team in the operating room monitored the hand-held radios, as did our team leader and others as necessary.

Our shortwave HF Radio was a TS-50 Kenwood and we used a G5RV wire antenna with a manual tuner. HF communications included voice nets with La Ceiba three times daily, pilot contacts and Winlink activities. A PMBO Winlink email station was set up in La Ceiba. It was monitored during the mission, enabling direct email communication to and from all IHS field sites to La Ceiba. This email station was also utilized for most of the International IHS traffic and enabled IHS team members to send and receive messages to and from 'home'. There was some initial difficulty establishing the Winlink PMBO because it had to be set up to scan two frequencies—Pactor 1 and 2 modes using the same frequency and Pactor 3 high speed mode on another frequency — but soon the airwaves were humming.

Our VHF/UHF radio was a Kenwood TM-G707A, which had been modified to receive family radio frequencies (FRS/GMRS) and was used to communicate with each of the remote teams.

The VHF 2 metre band radio initially transmitted and received through a Ringo Ranger antenna, which had been mounted, by the advance team, on a 20-foot tower behind the dorms. A higher gain TRAM vertical antenna had also been prepared and Bob intended to install it part way up the 200-foot tower in the compound. This proved difficult due to the combined weight and center of gravity of the antenna and the support frame, and the non-existence of a good hoisting point and line. However Bob and our interpreter (AKA the "Tower Rat" who is a fire fighter) finally hoisted the TRAM into position on Monday, the 23rd of February, and clamped it to the tower. Ideally the antenna should have extended two metres from the tower to give an omni-directional pattern. It actually extended only one metre, which was still sufficient to service our teams. There were cheers all round when the first transmission was pronounced "clear as a bell"! Intentions were to tidy up the installation and secure the cables to the tower the next day.

Our joy was short-lived. That afternoon the VHF radio was strangely silent. It seemed that everybody was managing perfectly well without PLP and it was not until the afternoon HF net that we were aware of a problem. We were off the air! On inspection we found the insides of the new antenna, complete with wiring, lying on the ground under the tower. We could only imagine the panic of the kid who had pulled out the cable when he'd tried swinging on it. It was back to the Ringo Ranger for the remaining few days of the mission.

Three of the four clinics sent patients to the operating room in a steady stream. Sometimes the radio operator needed to juggle microphones to the HF and VHF radios, adjust the tuner, and take notes at the same time. Three-way conversations were common as we relayed information about patients and arranged plane transport back and forth between the villages and PLP. In retrospect, the communications system was able to speedily handle anything the teams required.

The weeks of the mission flew by. There were many lives saved and made more comfortable but also times of tragedy. A baby died of meningitis, an old woman was diagnosed with terminal cancer, and a young woman in diabetic coma was rushed by boat through hazardous waters in the night only to die the next day. Life is fragile but IHS does make a difference in Honduras every year. We were deeply touched by our experiences there and our lives will never be the same again.

nr

## WIA news *continued*

access to the 7.1 to 7.2 MHz band for all UK radio amateurs have been finalised and that access was to be allowed from 0100 UTC on Sunday 31 October 2004.

Early access is granted on a Secondary (non-interference) basis using a maximum of 26dBW (400 watts) PEP for Full licensees, 50 watts for Intermediate and 10 watts for Foundation licensees.

## WIA makes special offer with Callbook release

With the release of the 2005 Callbook, the WIA is making a special offer to potential new members. You can obtain a 2005 Callbook and become a new member at a discount price. The non-members price of the Callbook is $30.00 picked up from the National Office or $33.00 posted.

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# Evolution of a high power "current balun"

By J. C. Laib, VK6CTL - Jaklaib@aol.com

**Here in the Western Australian sun, with UV indexes over twelve for six or more months on end, coaxial cables and plastics used as insulators deteriorate quickly after a number of years. After inspecting my antennas on top of a hot tin roof I realized that the sun had started to damage the hardware and it was time for some repairs.**

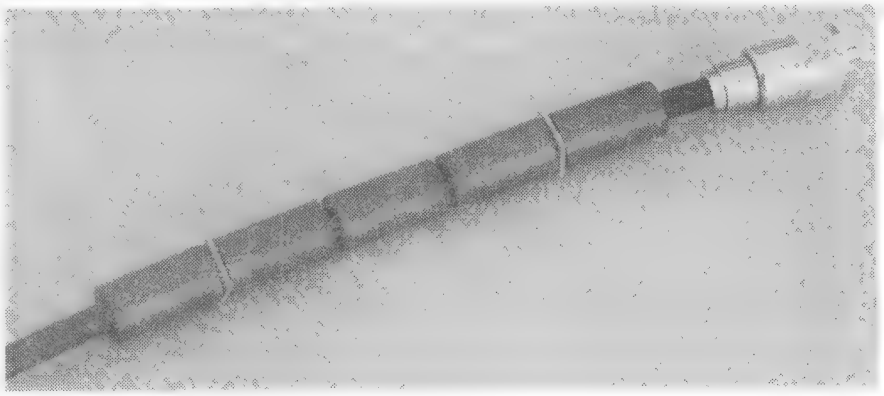
I found that both the insulators on my dipoles, the balun and the outer jacket of the RG213 coax had been damaged by prolonged exposure to UV. When all the work was finished the immediate improvement in station performance made me realise how many dB's had been lost to sun damage.

I was looking to purchase a new centre balun for my dipole when my eye caught a list of ferrite suppression sleeves used with computers for EMI suppression. Current baluns, originated by M. Walter Maxwell W2DU (1), use a number of ferrite toroids strung directly onto the coax cable where it is connected to the antenna.

Such choke baluns work nearly without any loss and tolerate high power and SWR levels without damage. The ferrite sleeves present a high impedance to any RF current flowing on the outside of the coax shield. The impedance stays fairly constant over a wide range of frequencies. Why not fit these ferrite suppression sleeves directly onto the new coaxial cable to form a broad band current balun?

I was already cramped for space with my three RG-213 coax feeders running to the roof of my apartment building. I decided to replace the RG-213 with AIRCELL 7 cable (2), which is widely used in Europe. AIRCELL 7 is an interesting replacement for RG-213, or the older RG-8, has a diameter of 7.3 mm and is rated at 2.4 kW at 30 MHz.

The fabrication of a current balun is very straightforward. Cut from any



available semi-rigid PVC sheet two squares of 12 x 12mm and drill a 7.3 mm hole in the centre of each (mine came from an old slide box).

Push one ferrite suppression sleeve of 14.3mm OD x 7.3mm ID x 28.8mm L (Altronics part No. L 4820) over the Aircell 7 coax to a distance of 250mm from the cable end. Then add one plastic square as a spacer.

Then push another three sleeves over the cable followed by the second plastic spacer and the fifth sleeve. Space the inner three sleeves by 1.5mm (see photo). Now gently slide a length of 170mm by 19mm diameter Poly-Tube irrigation pipe over the assembly. Do not disturb the placement of the spacers and sleeves. With electrical tape, or a 50mm length of 19mm diameter heatshrink tubing, seal one end of the tube and fill it fully from the other end with mixed Araldite or cured polyester resin. Compared with other electrical or plumbing tubes Poly-Tube irrigation pipe gives the highest protection against UV. The completed balun will therefore last a long time when exposed to the merciless sun of Western Australia.

Do not seal the assembly with a co-polymer sealer used for roofs and gutters as it will not completely fill the balun and make it waterproof. Now solder a UHF or Type N plug as close as possible to the end of the balun, making sure not to damage the weather seal. That's it!

If you are able to buy MIL-grade heatshrink tubing of 19mm diameter with a 1:3 shrinking ratio assembling such a current choke balun is even easier. Just gently push a 175mm length of such heatshrink tubing over the five sleeves and 1.5mm spacers leaving 12mm either side. I shrunk the tubing with a heat gun borrowed from my neighbor.

Shrink the tubing carefully but completely so that it shrinks into the spaces between the sleeve shoulders, to preserve the spacing, and then down to the coax. On both ends I applied VPC glue for additional waterproofing. For additional waterproofing I shrunk a second layer of heatshrink tubing, 185mm long, over the first one leaving 8 mm either side. I again applied VPC glue to the shrunken ends.

Tests with ferrite suppression sleeves

| Type | Mat | OD mm | kg/100m | VF% | Loss 28 MHz | dB/ 100m100 MHz |
|---|---|---|---|---|---|---|
| AIRCELL 7 | FPE | 7.3 | 7.2 | 0.83 | 3.7 | 6.6 |
| RG-213 | PE | 10.3 | 15.5 | 0.66 | 3.7 | 7.0 |
| RG-58U | PE | 5.0 | 4.0 | 0.66 | 8.0 | 15.6 |

Table 1

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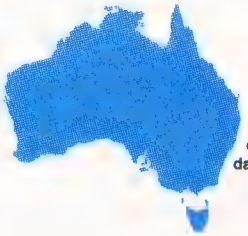

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have shown that five pieces, each 28.8mm long, give good performance from 10 to 30MHz. For use down to 3.5MHz increase the number of sleeves to nine and for 1.8MHz use sixteen. See table 2 for other ferrite sleeves and cable diameters.

The total impedance seems to be approximately proportional to the stacked length of the sleeves. You might find some other suppliers of EMI suppression sleeves with diameters closer to your preferred cable. Experiments are required to determine the minimal number of sleeves needed for good suppression of RF currents on the coax depending on which coax you use and required frequency coverage.

Such a balun may be used for any coaxial fed antenna. In stubborn cases additional chokes may be placed at approximately ¼ wave intervals along the coax cable. (see Table 2)

(Use heatshrink tubing or electrical tape on coax to increase diameter to ensure the sleeves fit tightly)


(1) ARRL Handbook 1999, chapter 19 on Transmission Lines, page 16-17.

(2) Kusch-Kabel Werke, Box 120339, DL-44293 Dortmund, Germany.


Only direct imports. Kusch supplies also a watertight UHF socket for 7.3mm AIRCELL 7 similar to a Type-N socket. www.kabel-kusch.de - kusch@kabel-kusch.de

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| Cable | OD mm | Part No. | Dimensions OD x L x ID | No. for 10 MHz |
|---|---|---|---|---|
| RG-58 | 5.0 | Jaycar LF-1258 | 12 x 25 x 5.6 | 5 |
| AIRCELL 7 | 7.3 | Altronics L 4820 | 14.3 x 28.8 x 7.3 | 5 |
| RG-213 | 10.3 | Altronics L 4830 | 28.5 x 28.5 x 12.3 | 5 |

Table 2

## WIA comment *continued*

already an experienced amateur himself. The advantage of the accreditation system administered by an RTO is that the assessment outcome is recognised across Australia.

### What would this require?

It would require all those prepared to become accredited assessors to spend a weekend becoming qualified.

It would mean that the candidate could learn immediately whether he/she is competent or is not yet competent.

It would mean that the assessor would be able to explain the decision and be able to tell the learner what he/she needs to do to become competent.

We see the change to an accredited assessor system taking place over a period, with as many clubs as possible encouraging one or more of their current invigilators to become an accredited assessor.

We also see the current system continuing, hopefully being utilised less and less, but providing a means by which examinations can be administered even if the club does not have available an accredited assessor.

At a recent meeting of clubs in Melbourne I floated this concept, basically asking if it was thought that the amateurs who act as group leaders and invigilators would be prepared to give the time to become accredited assessors. The result was that there was a concern as to whether people could afford the time, but at least everyone present was, when asked, more than willing to give the time.

I do believe it would produce a system having more validity, reliability and credibility than the present system, and avoiding the shortcomings of the present system that are so often criticised.

What do you think?

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# New microwave records set in VK4 and VK2

Russell Lemke VK3ZQB

**As a diversion from the cold southern states winter and an excuse to have a holiday, a group of microwave operators ventured into the sunshine state for warmer weather, rest and recreation and a bit of microwave playing.**

Bill VK3AMH started the migration with his annual northern holiday, closely followed by Colin VK5DK who decided that he was sick of work, the winter was too cold and he would like to join Bill and go north for a holiday.

I became involved when my wife heard of Colin and Bill's plans and decided that I needed to go to Brisbane to see my mother in law, check to see if I was still in the will and visit my son in Cairns.

Wives tend to make these irrational decisions from time to time. I was content to stay in the shack and finish the winter project.

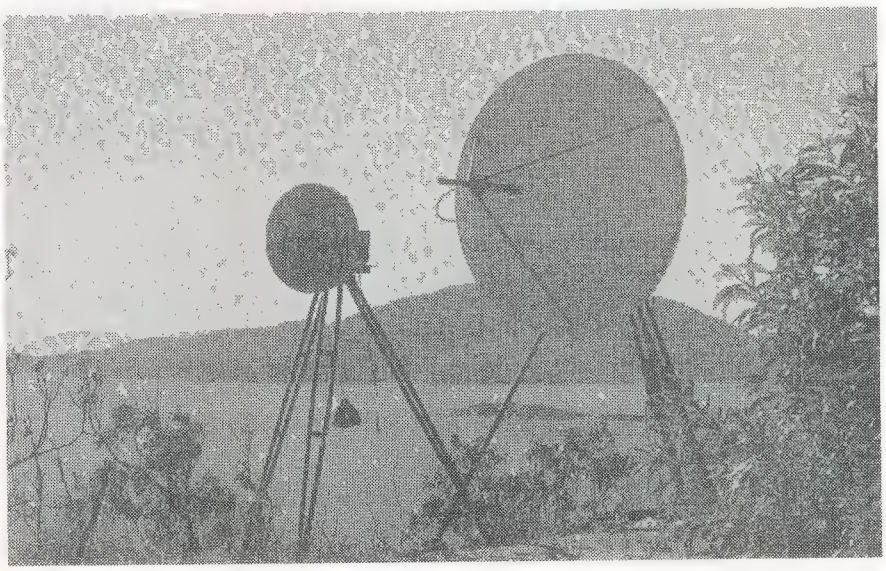
Alan VK3XPD also joined us for the most northern contacts bringing his 4 ft dish and some large powered amps, which proved to be very useful in the marginal conditions we experienced.

So with the shorts and thongs packed we made our way north to visit the relatives and get the social engagements out of the way so that we could settle down to the serious part of micro waving.

I think that we adopted the idea that because we were old hands at operating microwave frequencies, we should be able to add some kilometres to the records without too much trouble, Of course this was an arrogant approach and we were soon to be humbled when we found the task fairly difficult to achieve.

I suppose if we were going to be serious about extending records we should be there when the best propagation is present, not in the middle of winter, so it was predictable that we were going to have to fight hard to get any contacts at all.

The lack of any form of enhancement made it very difficult to add just a couple of kilometres to the records.



10 and 5 GHz dishes at Gloucester Point Hill

We teamed up with Errol VK4ZHL who was holidaying in Cairns and later on with Neil VK2EI. Doug VK4OE is presently constructing 24 GHz gear and was very interested to see how our gear worked.

Now the trip was not without trauma with Bill's wife Jannette taking ill and requiring hospitalization.

I was next when my car was broken into in Brisbane and some of the microwave gear was stolen along with the stereo system.

Alan hit a kangaroo causing significant damage to his car and Colin got a bad lot of fuel in his car and spent some time in dock getting the car's injectors serviced.

One of the difficulties in operating from an area that is not familiar is finding suitable locations to operate from. I use OZIEXPLORER mapping software with 3D capabilities to choose sites; first with 1/250 topographical maps then with calibrated satellite photos which help in determining the density of vegetation on a hill site.

I back up the mapping software with RADIO MOBILE software to plot the selected path and calculate the possibility of contact at different frequencies.

Still it is extremely hard to find sites that have easy access and often we find that what looks like a good spot on the map is either covered by trees, has a locked gate, no access or has been built on and is now the centre of a residential area.

Our first path relied on finding a location at Airlie Beach to work north to selected spots south of Cairns to the Daintree north of Cairns.

Colin, Alan and Bill went to Airlie Beach only to find that there was no access to the high ground that had a good view toward the north, so the nearest they could find was at Gloucester Point

Gloucester camp

Gloucester camp, north view

38 km further north than Airlie Beach.

The changed location for the southern end of the shot line meant that locations south of Cairns were going to be either less than the record distance or equal to it.

Errol VK4ZHL requested that we start from the sites north of Cairns as he already had accommodation in that area and it would be more convenient for him to try and work the longer distances first rather than travel to south of Cairns to work from the shorter distances.

This goes against good practice as working the shortest distance first offers more opportunity to make a contact, establish that the gear is operating and check frequency variations.

On the other hand, if there was good tropo then it would have been possible to work the longest distance with ease, a new record would be set and we could move on to the next stage, justifying the decision to work the longest distance possible and discarding the conventional approach.

As it happened there was no enhancement and no sign of signal on either 5 or 10 GHz so, with the lesson learnt, we packed up camp and moved south of Cairns closer to the Airlie Beach group, where we would attempt to establish contact.

Now while Errol and I were travelling all over Northern Queensland looking for a suitable site to work from, Bill, Colin and Alan were doing it tough.

They had found a cabin at Gloucester Point 50 metres from the beach and had set up their dishes in front of their cabin on the beachfront, then settled back to enjoy the magnificent tropical scenery and empty a soft drink or two.

Errol and I ended up at Flying Fish Point near Innisfail a distance of 378 km from Gloucester Point.

We established contact on 5 GHz with 5-7 reports first, then Alan set up his 4 ft dish and 14 watt amp on 5.7 GHz and I heard him with 5-9+40 reports.

10 GHz was worked with very poor signals indicating that the path offered little assistance with propagation.

The distance worked was under the VK4 record distance and it was obvious that we were going to have a hard time extending the record with these conditions.

We were also faced with having to find two locations more than 380 km apart, not an easy task as we were backed up onto a national park with limited access and Bill, Allan and Colin were also limited in where they could go.

We managed to find a track that placed us 3 km further north of Flying Fish Point while the others moved to high ground about 1.5 km south of their cabin, placing just over the current VK4 record with a distance of 382 km.

We tried again first on 10 GHz then on 5 GHz. 10 GHz yielded success with 5.1, 5.2 signal reports then on 5 GHz with 5.3 reports with Colin's 2.5 watts and 5-9 at peaks with Alan's 4 ft dish and 14 watts.

Contacts on both bands exhibited rapid flutter and QSB and conditions progressively deteriorated as the day progressed.

Bill's 10 GHz transverter blew a FET in the receiver preamp shortly after making contact at the 387 km distance and he had to retire his gear to be fixed when we returned to Brisbane,

With a new VK4 record on 5 GHz and 10 GHz set with very poor signal conditions, it was not going to be worth trying to extend these distances any further without significant propagation.

The next accessible site North was at Cairns, and this path was seriously cluttered with the hills at Yarrabah and the signal strengths received were not sufficient to overcome the increased

path loss that would be on path from Cairns to Gloucester Point.

It was time that we departed north Queensland and returned to Brisbane to repair Bill's 10 GHz transverter and regroup for the next stage.

The next part of our trip involved travelling into New South Wales and making contact with Neil VK2EI on 5 GHz, 10 GHz and 24 GHz.

Bill VK3AMH had travelled down to Port Macquarie to join Neil VK2EI while Errol VK4ZHL, Colin VK5DK and myself had teamed up to work from the north of NSW toward Neil and Bill

Our first try was to repeat a path used before to establish a VK2 record from near Cape Byron to North Brother near Neil's QTH at Port Macquarie, a distance of about 330 km.

On arrival we were met with heavy rain which moved along the shot line south.

10 GHz was tried first and soon we had made contact with a 5-2 report on rain scatter propagation.

We tried 5.7 GHz but with no result which surprised us as there was obviously a path there for 10 GHz. We suspected that there must have been some equipment failure at one end or the other.

Neil and Bill travelled south to Crowdy Head and we repeated the 10 GHz contact but the extra distance had stretched our ability to the limit and we could only get a 4.1 report with rain scatter propagation.

The distance from these locations was only 335 km and it was obvious that we were unlikely to extend the range past the record distance of 380 km on this occasion.

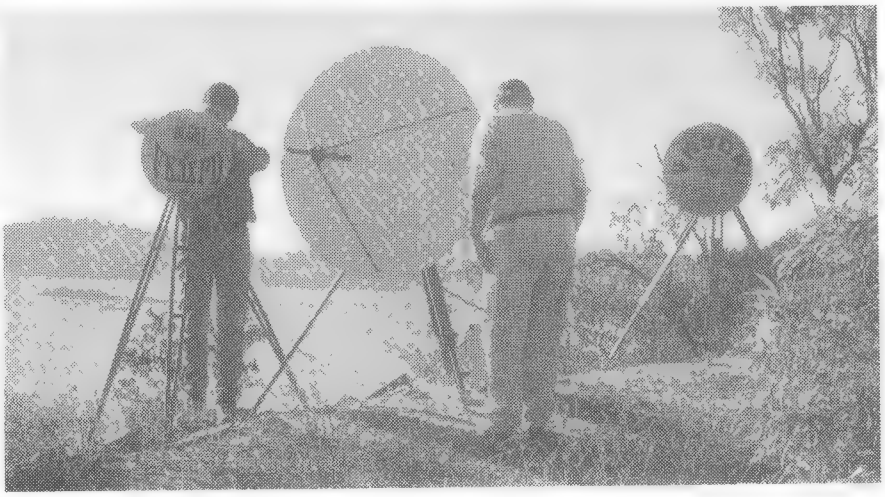
Errol, Collin and I decided that we would pack up and travel south to Coffs Harbour to be closer to Neil and Bill for some 24 GHz contacts.

The current VK2 24 GHz record had been worked from Coffs Harbour to North Brother and we thought that we would start there and then see if we could extend the distance.

The profile report indicated that from these locations we would have a line-of-sight path and we would only need to add a few more kilometres to take the record.

We established contact with Neil on 10 GHz with a solid signal then set up 24 GHz and made contact with 5-2 to 5-8 reports.

The transport at Gloucester Point



Gloucester Point Hill

We had considerable height at Coffs Harbour that enhanced the path but we were going to lose that advantage when we moved to the next site.

From Coffs Harbour we travelled to Woolgoolga and set up on a peninsula near the township. We established contact on 10 GHz and immediately knew that it was unlikely that we would be successful on 24 GHz.

10 GHz was weak with rapid QSB, not a good indicator for 24 GHz.

Nothing was heard on 24 GHz and we declared there was little use trying from there anymore without some enhancement or significantly more time to find another site with altitude.

Poor conditions, lack of propagation and limited time to look for suitable sites forced us to a "hit and run" type operation where we only had time to choose one or two locations and be content with whatever we managed to do from those sites in the time we had.

With more time and resources we could have exploited the propagation and locations with success.

Our trip was coming to its end and we decided to return to Brisbane having another shot on 10 GHz from our Cape Byron location on the way back.

Neil and Bill decided to go for broke and move south to Cape Hawk and wait for us to establish contact on 10 GHz.

Cape Hawk would be far enough south to give us a record from Cape Byron if there was any chance of making contact in the difficult conditions.

On our return north we encountered heavy rain and wondered if it was going to finish all hopes of extending the distance or enhance the path with an opportunity to work via rain scatter.

This was our last chance to salvage a

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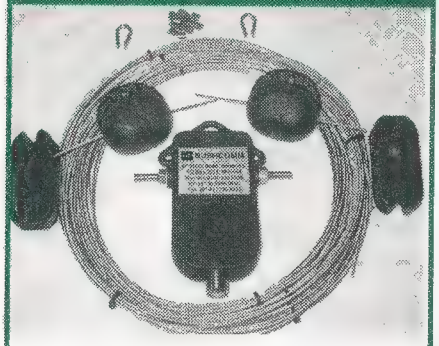

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record from the trip through VK2 and we were getting desperate.

Colin contacted Neil by phone to let him know that we were in heavy rain and it did not look good for any microwave contacts.

On arriving at the Cape Byron site the rain was easing and we set up 10 GHz and pointed the dish in Neil's direction.

Neil was transmitting a CW ident and it did not take long to tune him in and read the CW.

We reported to Neil that we were hearing his signal and contact was quickly established on 10 GHz. Reports of 4.1 were exchanged between all stations and a feeling of relief swept over us that at last we had achieved a new VK2 record of 399.7 km beating the old record by 18 km.

The final stage of our microwave holiday was to try to extend the 24 GHz VK4 record by taking advantage of the cold frosty mornings at Stanthorpe on the western slopes of the Great Divide.

We proposed three days would be needed and we would camp out on site so that we would be ready for an early morning contact on 24 GHz from the Mt Mowbullan in the Bunya range to Stanthorpe.

Somehow we wimped out of the cold start and decided to make a 1 day event trying out a spot that Doug VK4OE had found west of Stanthorpe to Mt Mowbullan.

Doug and I travelled to the Stanthorpe area while Colin VK5DK and Errol VK4ZHL went to Mt Mowbullan in the Bunya range.

We had performed this exercise on a previous occasion, but Colin's car developed engine trouble with dirty fuel injectors and he was unable to drive to the top of Mt Mowbullan, so we returned to Brisbane to effect repairs.

Our misguided belief that it should be easy to work 100 km+ on 24 GHz was our downfall and the distance was a bit too far without significant propagation.

We tried both 10 GHz and 24 GHz and were only able to communicate on 10 GHz with very poor signal reports considering the short distance. Nothing was heard on 24 GHz.

We were unprepared believing that plan "A" could not fail and had not bothered to bring either maps or computer to assist in finding a new location to work from or in fact develop any sort of plan "B".

The panic was on to make some mark on the record as I started driving North West toward Colin's position to shorten the distance and get a clearer shot at Mt Mowbullan.

The next four hours was spent driving along unknown country roads, down dirt tracks looking for access to hill sites with phone towers and generally getting lost.

At 5 pm just before last light, we found a rise near Millmerin that offered a line-of-sight shot at Mt Mowbullan and was 28 km further than the standing record.

We quickly set up 24 GHz and established contact. Signal reports were 5.9 indicating there was scope to increase the distance further except we had run out of light.

Driving around unfamiliar country in the dark would have been stupid, so we would have to be content with what we had done, keeping in mind that we could come back another time and add more distance to the record.

Just to add some figures to demonstrate the dedication or stupidity, depending on how you look at it, of the microwave enthusiast, at no time during this 24 GHz record attempt was I any more than 180 km distance from Colin's position at Mt Mowbullan and at the end of the day I finished up 120 km from his position.

To achieve this I had travelled a total of 750 km form Brisbane to Stanthorpe, Millmerin and return. All for 28 km increase in the record.

So what did we accomplish in this expedition? We enjoyed ourselves even though we had unwelcome experiences that we could have done without.

We reaffirmed our insanity status proving that we are still suitable candidates for the amateur fraternity.

We experienced rain scatter propagation and considering the amount of heavy rain that has been falling in Victoria during winter, perhaps more microwave operators should be out there trying some rain scatter contacts.

We had some success extending the VK4 5 GHz, 10 GHz and 24 GHz records and the VK2 10 GHz record.

I think everybody concerned learnt something and we all gained more experience in operating.

Roll on summer and let there be tropospheric propagation every day.

**ar**

# A vertical antenna for 15, 17 & 20 metres

John Howlett VK6ZN

**This antenna was developed for three-band portable applications and needs no tuner or coils. It screws into a heavy-duty mobile mount and is stored in a PVC tube mounted on the bull-bar of our mobile home. Although it behaves very well in high winds, the antenna is not recommended for mobile use!**

**It is easy to build; it is low cost and gives excellent results. And it offers the flexibility to go portable and get away from complaining neighbours and power-line noise.**

I would like to thank Trevor VK7TS for the loan of his workshop facilities to produce the antenna.

## Construction

[Note: 1 inch (1") equals 25.4 mm]

All materials were found at a *Mitre 10* hardware store:

1 x 16 mm x 2.4 metre aluminium tube (lengths A and C)

2 x 12 mm x 1.8 metre aluminium tube (lengths B and D)

3 x hose clamps

1 x 1/2" x 3" bolt

1 x 3/16" x 1¼" stainless nut and screw

Cut A to 1770 mm.

Cut B to 1720 mm.

Cut C to 150 mm.

Cut D to 1800 mm (if necessary).

Cut the head off the ½" bolt and insert into one end of length A, leaving 30 mm of thread exposed. Drill a suitable hole through the tube and ½" bolt and fit the 3/16" screw with nut. Trim off excess thread.

Cut 4 slots in the other end of length A.

Cut 4 slots in both ends of joiner length C.

These slots should be about 15 mm long and about 1 mm wide, to ensure that the clamp makes a good grip. An alternative would be to use 6 slots at the width of a hacksaw cut.

Fit joiner length C over one end of length B, adjust the total length to 1800 mm and tighten the hose clamp. Slide length B into A, adjust the total length to 3020 mm and tighten the clamp.

Screw the antenna into the mount and check for resonance on 15 metre. Adjust the length for best VSWR.

Mark the clamping position for future reference.

Fit length D into joiner length C and check resonance on 20 metre. Adjust the length if necessary but VSWR will probably be optimum already.

For use on 17 metres, assemble as for 15 metres then slide B out of A until resonant on that band. Set the antenna length for minimum VSWR and clamp firmly.

Mark the clamping position.

## Performance

Being low Q, it works fine in the CW and SSB sections of the bands. I get a VWSR of 1.2 to 1 on 15 and 20 metres. On 17 metres it goes up to 1.4 to 1. These figures will vary for different vehicle configurations or earth systems.

It performs better than my (expensive) multi-tap mobile antenna by at least 2 S-points. On-air tests indicate the same performance against a 20 m wire dipole. And against a 20 m delta loop the performance was much the same, except the loop was much quieter.

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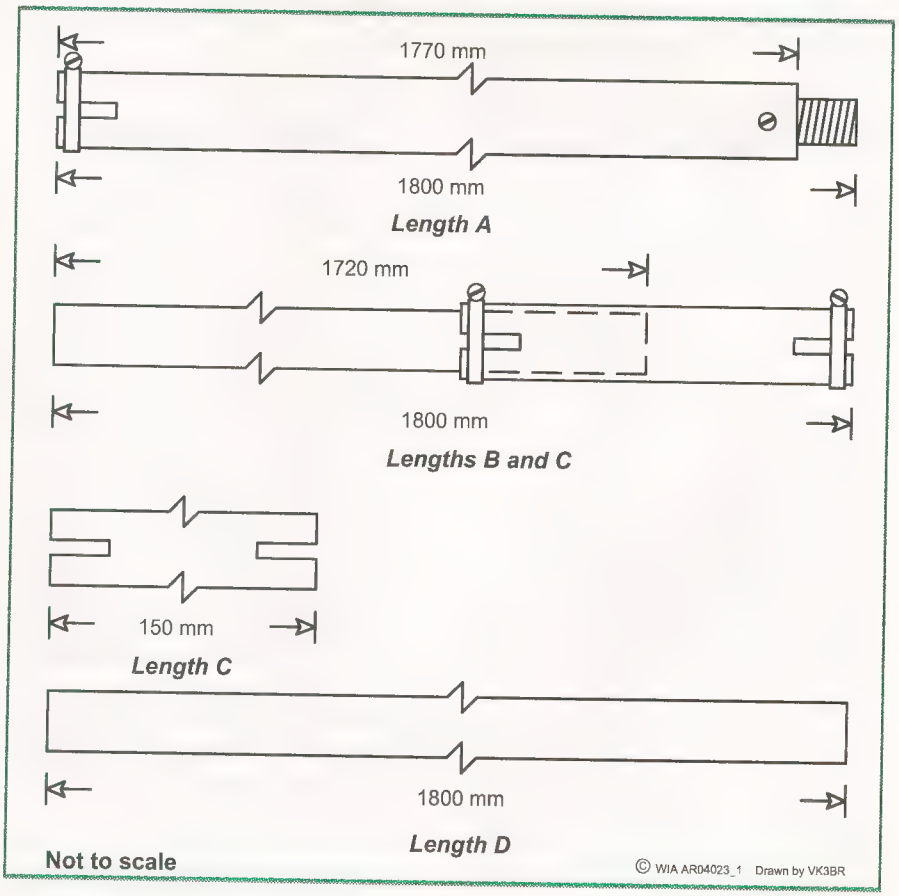


# State news

# VK1 news

## CRARC Forward Bias

**Peter Kloppenburg VK1CPK**

CRARC has been fortunate in having part of its repeater system located in the Telstra tower on Black Mountain (812 m) in the middle of Canberra. This repeater assembly, halfway up the tower, covers the ACT and the region very well. However, as is common now, a recent review and site audit by Telstra management, re-assessed the site rental at more than $5000 per year. This rental would be charged from 31 October '04 onwards. This amount is beyond CRARC's ability to pay, and therefore it was decided to remove the repeater assembly from the tower before that date, and find another site for it. The Committee is now in the process of approaching a number of other site owners who might be willing to accommodate the repeater assembly. As soon as a new repeater site has been obtained, the repeater assembly will be re-installed, together with an additional repeater, to cater for a demand for an increased number of communication services.

On the subject of changes, during the last general meeting, members voted for a name change from VK1 Division to Canberra Region Amateur Radio Club (CRARC). This change together with changes to the constitution must first be approved by the Registrar General before they become a matter of fact.

After July 2005, membership of the WIA no longer includes membership of a state division and, therefore, each state-based club will seek its own membership. WIA membership renewal application forms will include an invitation to join a local amateur radio club or a former division that has changed to a club. Membership of CRARC is $20.00 per year, and application forms are downloadable from the Website at www.vk1.wia.ampr.org

The weekly 80-metre net will be restarted on Sunday, December 5, 2004 at 8.00 pm by our president, Alan Hawes VK1WX. The net callsign is VK1WI at a frequency of 3.570 MHz, plus or minus QRM. The objective is to provide local news and other items of interest to radio amateurs in Canberra and the region. These may include WICEN news, general club information such as meeting dates or guest speakers. Much of the net's content will depend on feedback from radio amateurs, or listeners, during net operations. It also provides an opportunity to test HF antennas for local coverage, and, for VK1 Award seekers to make contact with VK1 radio amateurs. The Committee is calling on all Canberra and Region Radio Amateurs to participate in this initiative, to provide feedback on net content and to give Award seekers a chance to work VK1 Hams.

The next General Meeting will be held on Monday, February 28, 2005 in Scout Hall, Longerenong St., Farrer, at 8.00 pm. Cheers.

# VK2 news

The NSW Division held the EGM on Saturday 30th October for the membership to vote on signing an implement agreement - known as 3D of 3/8/2004 - with the National WIA. Over sixty members attended Amateur Radio House. A further one hundred and sixty seven tendered an apology. Following speakers for and against, the motion was put. It was carried three to one in favour in signing the agreement. Council is now dealing with the mechanics of completing the agreement.

Informally raised at the meeting was the timing of the Sunday news session with respect to the State and National segments. The majority of members favoured the combining of both presentations into a single segment commencing at 10 am. This was commenced last month. Obtaining the audio file of the national segment at the Dural site has been difficult due to landline limitations until the combining of the segments was made possible by an offsite download and RF path, provided by Steve VK2BGL. Tests are now being conducted with wireless Internet providers for a possible on site facility.

Last New Year there was operation from VK2WI as part of the welcome to the New Year. It is being considered that a similar activity be conducted to welcome in 2005. The news sessions will keep you informed. The VK2 Bookshop advises that the range of EH antennas has now been sold out.

A Conference of Clubs was held in Sydney early November. A few weeks before that a country 'club conference' was held in Armidale, hosted by the Walcha Club. It has been suggested that the first conference for next year should be about May in a country region, yet to be determined. A Novice / AOCP course commenced at Amateur Radio House - Parramatta last month. There will be a break over the holiday period. It is expected to conclude mid 2005. The course instructor is Terry VK2UX. The course can also be used as an upgrade to the AOCP level. It is not too late to join if you are aware of anyone wanting take part in a Sydney located course. Amateur Radio House is close to the western train line. For details contact the Parramatta office - 02 9689 2417.

Many VK2 Amateurs will know Jeff VK2BYY as the Dural station Engineer during the 1970 - 1980 period. Also he is a regular attendee in the pedestrian foxhunts at the various field days. Jeff is noticed at these events as running bare foot - that is without shoes, not the RF version. Jeff has spent some time in the New England region of NSW. Now back near Sydney, Jeff has turned his hand to being an author and a few weeks ago released his first work, a novel set in the New England area with a story line of astronomy and barefooting. Classified as a work of fiction, Jeff's novel 'Barefoot Times' has the ISBN number of 1-9208-8474-2, published in Queensland by Zeus Publications. Keep up the good work Jeff, let us know when the next edition is coming out. Season's greetings. 73 - Tim VK2ZTM.

# VK6 news

Will McGhie VK6UU
will2@iinet.net.au, 08 9291 7165

## Another Special General Meeting

**By the time you read this, the SGM will have been held on 4th December 2004.**

All members of the WIA VK6 division should have received in the mail the Agenda and Proxy forms for the next Special General Meeting. You may be surprised to find yet again a motion to wind up the division, even though it was defeated at the last SGM. However the margin was narrow.

The majority of VK6 Councillors and Members are in favour of winding up the Division. However not all Councillors or members are in favour and this has been of considerable value to make sure winding up the VK6 Division is thoroughly examined. Winding up the VK6 Division has proved not as easy as might be thought. There are many functions that the Division provides and some of these functions have proved difficult to sort out. The VK6 Council are on top of what has to be done to wind up or transfer responsibility and already many changes have taken place. This second vote on the future of the VK6 Division hopefully will give a clearer indication. At the last SGM the majority of members voted to wind up the division but the vote was so close (74.6% of voting members) with only a couple of votes deciding the outcome. Note the 75% required to wind up.

All this said, the majority of VK6 Councillors maintain the belief that winding up the VK6 Division is the way to go hence the second attempt to wind up the Division at the SGM on the 4th of December. The VK6 Council hope there is a good turn out at this meeting and VK6 notes will report on the out come of the SGM in February's Amateur Radio Magazine.

By the time you read this the VK6 website will have moved from the iinet account which will have been closed. The new Email address for contacting the WIA Advisory Committee is vk6advisory@vk6.net and the new web address for WA History and links to WA Clubs etc. is http://www.vk6.net

Perhaps for the last time from the VK6 Council, all the best for 2005.

# VK7 news

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au. Regional Web Site: www.reast.asn.au

## Tasmanian Hamfest 2004

Hamfest organisers have let me know the preliminary list of companies and groups who will have displays at the Hamfest and it includes TTS Systems, Benelec, Marcom Watson (ICOM), TET Emtron & Bushcom antennas, Solar Tasmania and ALARA.

It's happening on December 4 at Miena at the Southern end of Great Lake in the Central Highlands. Starts 1100 and finishes at 1500, gold coin entry fee, Coffee and tea will be provided and food will be available. There will be operating displays, stations, CW, ATV, APRS, digital and vendor displays plus several prominent guest speakers.

This event is targeted towards to all of those souls with an interest in radio. HF operators, VHF/UHF/Microwave, Novices, CB operators in fact anyone who enjoys experimenting with radio communications. See you there!

## Jamboree on the Air in VK7

JOTA/JOTI in VK7 was alive and well over the weekend of October 16 & 17. In the North of the state at Corra Lynn Scout Camp, Tony VK7YBG was operating with assistance from VK7HDX, VK7HAR, VK7ZJA, VK7NAU and others.

In the South, Rod, VK7TRF and others operated VK7SBB at Orana Camp at Roaches Beach for the Blackmans Bay & Huntingfield Scouts. At The Lea, Brian VK7HSB, Harvey VK7KSM, Roger VK7XRN and Graham, VK7ZGK operated the Hobart and Glenorchy scouting Districts' station VK7SAA.

A big thank you to all these stations and any others who helped out local scout and guide groups. I am sure you are all waiting for the delivery of your JOTA operator's badges!

## Northern Tasmanian Amateur Radio Club

At a meeting of Northern amateurs on October 13, it was agreed to form the Northern Tasmanian Amateur Radio Club (NTARC). Membership of the Club is open to all whether an amateur, non-amateur, member of the WIA or not and the membership fee for 2005 will be $12.00 for WIA members and $24.00 for non-WIA members. The executive of the club has approved a membership certificate, which they hope will enhance any radio shack.

## Radio and Electronics Association of Southern Tasmania Inc.

### APRS Update

APRS coverage around Hobart is now very good, with digipeaters at Guy Fawkes Hill (Ken, VK7KRJ), Moonah (Will, VK7HIL), Kingston (Scott, VK7HSE), Techno Park (Danny, VK7HDM), Brighton (Roger, VK7HRW) and New Norfolk (Bob, VK7KRW).

So, if you see a group of amateurs huddled around a notebook peering at a local map they are probably looking at someone with an APRS terminal on board moving about Southern Tasmania. For more information contact Ken VK7KRJ, he can be found on R2 or up at the domain most Wednesdays.

*"Hey, Old Timer..."*

**If you have been licensed for more than 25 years you are invited to join the**

**Radio Amateurs Old Timers Club Australia**

or if you have been licensed for **less than 25 but more than ten years**, you are invited to become an **Associate Member** of the RAOTC.

In either case a **$5.00** joining fee plus **$8.00** for one year or **$15.00** for two years gets you two interesting OTN Journals a year plus good fellowship.

Write to
RAOTC,
PO Box 1100
Sandringham VIC 3191
or call Arthur VK3VQ on **03 9598 4262** or Bill VK3BR on **03 9584 9512**,
or email to raotc@raotc.org.au
for an application form.

# *Amateur Radio* Magazine Awards

**The Editor, Colwyn Low VK5UE, attended the Adelaide Hills Amateur Radio Society meeting on 19th August 2004 to present Lloyd Butler VK5BR, with the certificate and a cheque for $100 as the Amateur Radio Magazine Technical Award for 2003.**

Presentation of the Amateur Radio Magazine Technical Award to Lloyd Butler VK5 BR on 19th August 200

This award is presented each year to the author of an article or articles published in Amateur Radio Magazine that is considered to be significant in terms of content and presentation of a technical subject in the field of amateur radio activities. Lloyd's articles on aerials were of a very high standard.

The other award made by Amateur Radio Magazine each year is the Higginbotham Award for contributions to the magazine. The 2003 award was made to Gil Sones VK3AUI in recognition of 30 years being part of the production of AR and contributing to its content. Gil became a Silent Key in November 2003.

**ar**

## VK7 news *continued*

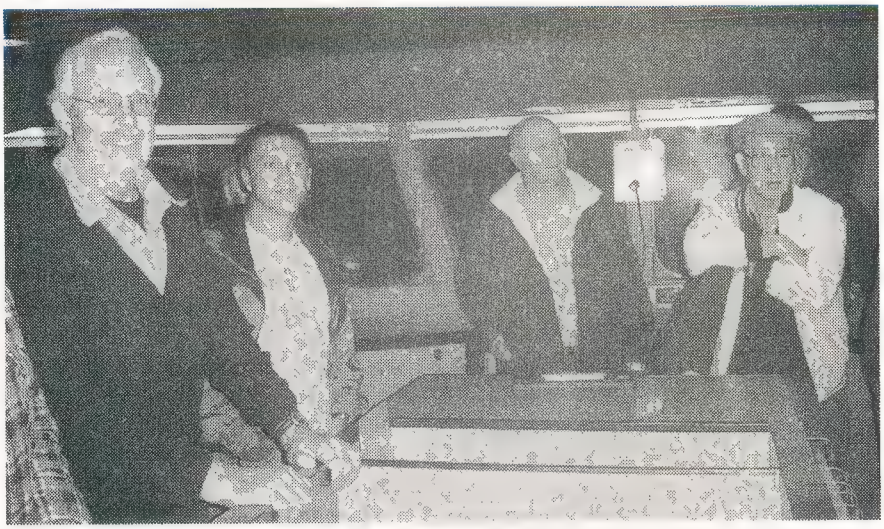
### Visit to Incat

Wednesday November 3 saw about 30 REAST members and friends have a guided tour by Skipper Chuck and Chief Engineer, Chris, of the US Army Joint Venture Catamaran HSV-X1. A 96 metre Evolution 10 wave piercing catamaran that has been used by the US Army as a fast logistics, troop transport and command/ communications platform. It is currently in for a major service.

The communications room was a very impressive wall array of plasma TV screens, LCD command stations all fed by 18 PCs. The computers are fed via encrypted satellite links.

Thanks a million to Chuck and Chris for taking the time to show us around the vessel and thanks to Rod Goss from Incat for organising the tour.

**ar**



On the bridge of the catamaran LtoR: Mike, VK7FB, US Army Skipper, Chuck West, Bill, VK7WR and Les, VK7LS.

## Dalby & District Amateur Radio Club

Rick Lammas VK4NRL President

Our club has just put a 63cm repeater on air here in Dalby. Callsign is VHD07. As can be imagined much thought and planning went into this project before it became a reality. Members built two half wave co-linear antennas which were mounted on the local community radio station tower in Dalby.

This repeater has resulted in a renewed interest in amateur radio with some new members for the club and two have applied to sit for their novice exams.

This has been a good exercise for the club and special thanks go to our Repeater Co-ordinator, Mike VK4XT, for all the time consuming and hard work he puts into keeping our repeaters up and running.

The 2m repeater on 146.675 MHz now has Echo Link on trial – node number 209093. Repeater on 438.700 MHz is working well also.

So, if you are coming through Dalby give a call on these repeaters and if someone is available you are sure to be answered.

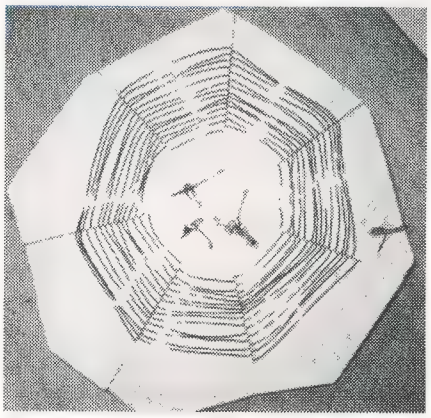
## Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

The October meeting was a challenge our soldering (and counting) skills. Graham VK5ZFZ conducted another of his construction nights. This time it was an old fashioned disk radio.

The counting part was associated with counting the number of turns of wire you wound onto the disk of card that formed the aerial. The aim was to use approximately 5 metres of fine wire with which to wind 19 turns (it could be argued that it really was 38 or 39) onto your disk, weaving the wire in and out of the 'spokes' you had cut in the disk of cardboard. You should have finished up with 19 wires across each gap. Some people (of whom the President shall be nameless) wound 19 turns altogether so they had only 9 on each spoke, others found their arms weren't long enough to measure 5 metres so they had to add more wire.

Anyway, once the aerial was made a transistor, a capacitor and a couple of resistors and you could test it to see if you could hear the local ABC station.



The coil with some components in the centre

There were some happy faces, so some people got it right, and everyone enjoyed it

By the time this piece 'goes to air' we will have had our big Buy and Sell (or social occasion) and it will be the Festive Season so:

MERRY CHRISTMAS AND HAPPY NEW YEAR TO ALL

New ALARA member, Jenny, with her radio. It worked!.

## Old Timers' Luncheon in VK5

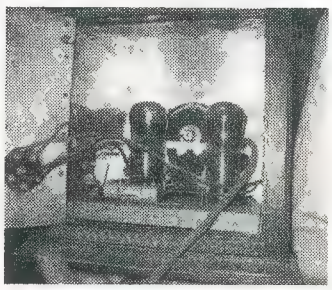
Christine Taylor VK5CTY

The Old Timers' Luncheon in VK5 was held late in October. The numbers attending seem to decrease each year but everyone enjoys the occasion. Remember you are eligible to attend the Old timer's functions and to participate in their regular nets if you are over 50 years of age and have held a radio licence for at least ten years. Novices and Limited Licensees are eligible and welcome.

The luncheons currently are held at the Marion Hotel which is served by public transport, so not being a driver is no restriction, either. In other words, come along and have a pleasant lunch with people who share your interests.

This year, again, Vaughan Harvey (not an amateur, but a public broadcaster for many years) brought along some of the treasures and mysteries from his radio museum. As the first photo shows it drew the diners like bees to a honey pot. The second photo shows one of the old radios. There were a number of "I remember those" from the audience as they studied the components. The radios work better these days but they were more interesting to look at inside, back then.

Bees around a honeypot



The "honeypot"

# ALARA

Christine Taylor VK5CTY

## Can you help?

Next year, 2005 it will be 30 years since ALARA was formed. In looking through the early history we realise that there are a number of YLs who were active in those early years, with whom we have lost contact. Can you help?

Some of the people with whom we have lost contact, that appear on the first few pages are; Rhonda de Stefano, Irene Robinson, Jenny Roper, Joan Poulter, Judy Gellert, and Anne, XYL of VK7FB.

Some of these YLs we know, were XYLs or harmonics of amateurs, others had licences in their own rights. Some of them may have married and changed their names, or now have licences.

We would love to see some of them at the ALARAMEET in Mildura in September next year but we would be delighted just to have a note to let us know how they are and what they are doing now.

There will be more names in the National Broadcasts and in this column in the months to come. YOU ARE WARNED.

If you know any of the YLs involved in those very important early days please contact them and ask them to contact us. My e-mail address is geencee@picknowl.com.au and my address in the callbook is correct.

## JOTA and Vic's radio equipment

This year saw the usual activities between amateurs and scouts for the Jamboree On The Air. Jeanne VK5JQ was active in the radio shack at Woodhouse, the main Scout campsite. Susan VK7LUV was busy in Launceston. Although I have not heard, I suspect that Bev VK6DE had some girls or boys in her shack again, and I am certain that Norma VK2AYL was involved along with her OM, Frank and her three girls, somewhere in New South Wales.

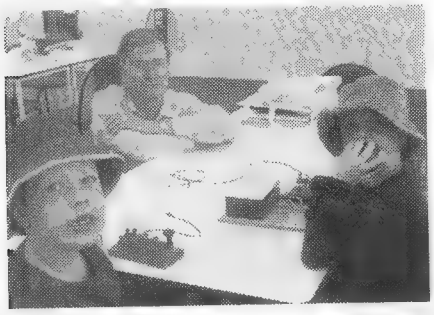
ALARA took the opportunity of the weekend when there would be much radio activity, to have the official 'handover' of those radios and associated equipment. A group of us went down the RIG headquarters at Glenelg, a seaside suburb of Adelaide, to see the radios being used and to make the presentation.

The group comprised one of the foundation members of ALARA, Myrna VK5YW, a very new member Jenny, the State Rep for SA, Jean VK5TSX and the Historian Christine VK5CTY.

However, we had a problem. The radios, especially the HF rig were in such constant use that we were loath to interrupt just for a presentation. So the four of us stood around the desk where one young boy was making a contact with a Scout in Queensland to have the official photo taken.

The whole room was abuzz with activity. Handheld radios were being used across the room to play "Battleships", a VHF radio was in use for cross city contacts, as well as the HF rig which was constantly in use. Right in the middle of the room a table was busy with young people sending their names and messages they were making up, by Morse Code. The keys had the Code taped to the top so they could read the appropriate set of 'dits' and 'dahs' for each letter. Kevin, VK5AKZ was writing down what was sent – and sometimes being told "That was not what I meant" when someone got it wrong.

It was an exciting sight and promises well for amateur radio in the future.



Kids with Morse keys

Official handover of Vic's radios. L-R Christine VK5CTY, Jean VK5TSX, Myrna VK5YW, Jenny

Kids with computers

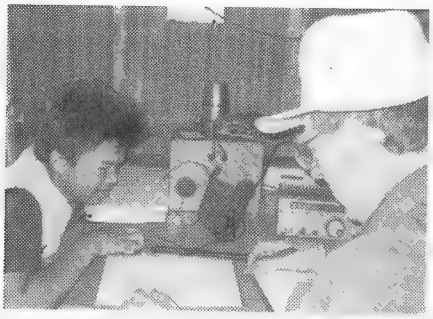
Boys and girls and radios

### JOTA at Yundi...

Rufus VK5YO in his 28th or 29th year taking JOTA to the Black Forest Scouts at Yundi with his own callsigns and VK5KR the call of the BF Scouts.

## A Silent Key

Many YLs visiting Alice Springs have been welcomed on air or in person by Moira VK8NW, who became a silent key early in October this year. We extend our sympathy to her family and friends.



VK5YO with one of the scouts at Yundi

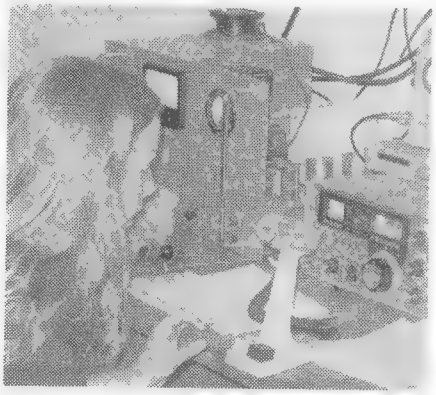
Jeanne VK5JQ helps Brooke, a 7-y-old Joey Scout handheld on 70cms

Glenys a 12-year-old on the HF rig with Jeanne and Amee watching

**...and the One Tree Hill group.**
All OTH scouts are 12 years old except Brooke.

Amee using the local VHF repeater

Brooke taking a turn on the HF rig with Rachel, Amee, Glenys, Phoebe, Sabine (XYL of Dean VK5ZDW) Carol and Jeanne looking on.



Phoebe on the HF rig.

## The Florence McKenzie Trophy in a new home

The Florence McKenzie Trophy, which was donated to ALARA in August 1982 by the Townsville Radio Club, is competed for each year during the ALARA Contest. The ALARA member scoring the highest points for CW contacts wins the trophy.

The actual trophy is rather large and would be expensive to send interstate so for some years the trophy has been housed behind glass while the winner, if any, receives a very attractive certificate on which is a colour photo of the trophy. Over the years several actual presentations of the trophy have been made and the trophy has spent a year or so on a mantlepiece, but mostly it has been on show.

Unfortunately when the Burley Griffin Building, headquarters of the WIA(SANT) Division, became unavailable when suburban councils amalgamated, the trophy lost its last permanent home. Since then it has certainly spent some time on a mantlepiece, in the home of Pat VK5OZ the last winner, but it has also spent some time hiding in a ceiling.

When the Radio Interest Group (RIG) was established within a large building ALARA asked if there would be a place where the trophy could be again on show to the public. They were able to provide such a place, so Pat packed up the trophy and it made the journey to its new home.

The official handover of the trophy was also held during the visit over the JOTA weekend. The Florence McKenzie Trophy will still be competed for during the ALARA Contest as usual, and may even be used in a similar fashion within the Scout Association, with a certificate to the winner. In the meantime the handsome trophy is on public display again.

Presentation of Florence McKenzie Trophy to Dean VK5ZDW Scout Commissioner for Radio in SA

## A successful International YL Meet in Seoul

A full report and pictures will be in the next issue of "Amateur Radio" but it can be reported that there were over 100 attendees from around the world plus a number of OMs and that the next International YL Meet will be in Mombai in 2006. Watch this space for more information.

## Seasons Greetings

May you all have a good Christmas and may there be a better New Year to come, from all in ALARA to members and everyone interested in amateur radio.

2004 has seen some important changes for us with the abolition of Morse Code as an examination subject. Interestingly this has not stopped people requesting Morse Code exams. Maybe it has been seen as a challenge so that new code skeds are also heard from time to time.

The other important change for amateurs has been the adoption of the new WIA as an administrative body that covers us as individuals instead of as members of a state body.

Similar but different changes were reported in one of the "YLRL Harmonics" and in "BYLARA" earlier in the year suggesting there was a season of change in the US and the UK, too.

"HAPPY CHRISTMAS AND NEW YEAR TO EVERYONE"

# Spotlight on SWLing

Robin L. Harwood VK7RH

## 2004: a year of change

The year is almost over and it has been a year of change. Swiss Radio International closed down at the end of October after 69 years of continuous service on shortwave. A new internet-based service has replaced it. Other broadcasters have been gradually reducing their output with another international broadcaster deciding to opt out of shortwave broadcasting at the end of March next year. The Belgian International Service, RVI, suddenly announced at the beginning of the B-04 period, that they will no longer be broadcasting in Flemish and other languages, nor will they be continuing to hire spare transmitting capacity from other organisations. A daily relay from one of the domestic networks lasting four hours, targeting central Europe, will come from an existing sender within Belgium via shortwave.

RVI does have quite a few listeners here in Australia to their relay via the Kamchatka Peninsula on 9945 from 1200. Programs are in Flemish and English.

Other broadcasters also are reducing their output including Radio Cairo in Egypt. Their foreign language output is apparently being cut from 40 to 11 different language services. English will be continuing as will Arabic yet they have always been plagued with inconsistent modulation or frequency stability. For Australasia, it is on 9950 from 2100 in either Arabic or English and is often unstable.

Deutsche Welle now based in the former West German capital of Bonn has also been reviewing their output, due to budgetary pressures. However it appears that the international television arm from Berlin could be the section to face the axe. DW TV is apparently available via American cable and satellite operators, yet has not become commercially viable.

Talking of international television, I notice that the Italian RAI Network from Rome, is currently on AUSTAR together with Greek private network. Programming is naturally in those languages and these same services may be available on either FOXTEL or Optus. I have previously mentioned that I am able to get the BBC World Service as one of the optional radio channels on AUSTAR around the clock. The Radio Italia network is no longer available.

### "Passport To World Band Radio 2005"

I received my copy in the last week of October direct from the publisher and this annual edition has not deviated from its format.

This edition has been focusing on Thailand and Laos and the stark contrast in the media in both nations. There are very interesting receiver reviews as well as antenna accessories. The blue section in the back has been retained but I am surprised to find that frequency listings of many of the American private stations have not been updated. Perhaps there was a delay in the information reaching the publishers. Fortunately the information is readily available on the Net from the stations or from other sources. Last year the blue section quickly became outdated as there were so many frequency alterations made at the commencement of the B-03 period.

The cost for PWBR 2005 was $27.95 US direct from the publishers and available locally from Padula Books in Melbourne for about $50 Australian.

Propagation conditions have not been good as the higher frequencies drop off. The Solar minimum is expected next year or early 2006 and it will be slow climb back upwards. There currently is a blackout as I am compiling this month's column.

Well that is all for this month. All the best for Christmas and have a Happy but safe New Year. I hope that you will have good monitoring over the holiday period and see you in 2005

ar


VK DISCOUNT CABLES

WHAT ARE YOU DOING DURING YOUR XMAS HOLIDAY BREAK ?

*Installing towers, antennas or maybe just maintenance ?*

For the month of December we are having

***5% to 10% off***

all cables and other selected items!

*HURRY WHILE STOCKS LAST*

RG-58CU (MIL-C-17G) @ $60 per 100M QTY SAVE 5%
RG-213 (MIL-C-17D) @ $165 per 100M QTY SAVE 5%
RFS HELIAX LCF14-50J (1/4) @ $4.00 per metre SAVE 5%
RFS HELIAX LCF38-50J (3/8) @ $4.60 per metre SAVE 5%
RFS HELIAX LCF12-50J (1/2) @ $4.85 per metre SAVE 10%
RFS HELIAX LCF78-50J (7/8) @ $8.00 per metre SAVE 10%
TIMES LMR 195 (58CU Low Loss) @ $3.00 per metre SAVE 5%
TIMES RG-214 @ $10.50 per metre SAVE 10%
TIMES LMR 400 (BEL9913) @ $3.90 per metre SAVE 10%
TIMES LMR 400 ULTRAFLEX @ $5.50 per metre SAVE 10%
TIMES LMR 600 @ $7.85 per metre SAVE 10%
1/2" HELIAX MALE & FEMALE N TYPE CONNECTORS @ $40 Ea SAVE 5%
7/8" HELIAX MALE & FEMALE N TYPE CONNECTORS @ $50 Ea SAVE 5%
BEL9913 MALE & FEMALE N TYPE CONNECTORS @ $12 Ea SAVE 10%
UHF SERIES CONNECTORS (Clamp PL-259) @ $12 Ea SAVE 10%
PL-259/213 CONNECTORS @ $2.50 Ea SAVE 5%
PL259/58CU CONNECTORS @ $1.50 Ea SAVE 5%

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ROB VK2XZ
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EMAIL : rob_vk2xz@hotmail.com


## Silent key

### Fred Ward VK5FE

On Saturday 2nd October 2004 my friend and fellow Radio Amateur, Fred Ward passed away after a long illness. Fred a keen CW operator served with distinction in World War II as a signalman in France, Belgium, India and finally Singapore. In Australia Fred was employed as a telecommunications technician and operated from many parts of South Australia.

My sympathy and condolences to his wife Margaret and family.

**Jim Mackison, VK5MB.**

# Contests

Ian Godsil VK3JS

## Contest Calendar December 2004 – February 2005

| | | | |
|---|---|---|---|
| 3/5 | Dec | ARRL 160 Metres Contest | (CW) |
| 4 | Dec | TARA RTTY Melee | |
| 11/12 | Dec | ARRL 10 Metres Contest | (CW/SSB) |
| 18 | Dec | OK RTTY Contest | |
| 18/18 | Dec | Croatian DX CW Contest | |
| 26 | Dec | Ross Hull Memorial VHF+ Contest | |
| until 16 Jan., 2005 | | | |
| 15 | Jan | 070 Club PSKFest | (PSK31) |
| 15/16 | Jan | Summer VHF Field Day | (CW/SSB/FM) |
| 15/16 | Jan | Hungarian DX Contest | (CW/SSB) |
| 16 | Jan | End Ross Hull Memorial VHF Contest | |
| 22/23 | Jan | REF Contest | (CW) |
| 5/6 | Feb | 10-10 Intl. Winter Party | (SSB) |
| 5/6 | Feb | Mexico Intl/ RTTY Contest | (RTTY) |
| 12/13 | Feb | CQ WW RTTY WPX Contest | (RTTY) |
| 13 | Feb | Asia-Pacific Sprint Contest | (CW 20/40m) |
| 26/27 | Feb | ARRL Intl. DX Contest | (CW) |
| 26/27 | Feb | Russian PSK WW Contest | (PSK31) |
| 26/27 | Feb | REF DX Contest | (SSB) |

## Greetings to all readers,

As you will see from last month's notes, I am quite concerned about the impact of BPL on our hobby. This is over and above just the contesting scene – as I wrote, it will influence our WHOLE AR hobby, possibly to the point of eliminating it if the mode is allowed into our community.

Some will argue that the Contest Notes are not to be used for political discussions, and I agree totally. However, I don't see the raising of an issue relevant to the whole hobby as being political, rather an attempt to get readers thinking. That being said, let me return our attention this month to the business of contests.

### Ross Hull and Summer FD Contests

You will see below the rules for this year's Ross Hull Memorial VHF Contest and January's Summer VHF Field Day. Please check carefully, as there are some changes made by John Martin, the long-standing Manager of this event.

### 2005 hopes

In 2005 I shall aim to tighten the presentation of contesting news to you all. It is not such a difficult job to assemble information from various sources; the difficulty is in preparing it in advance for publication in this magazine. As you know, printed material lead times are quite long. How easy it would be if we all used the Internet to get our information!

Nevertheless, I am still old-fashioned enough to believe that there are operators in VK who do not use The Net and so rely on this magazine. Hence our attempts to keep you informed via this means.

To this end, I shall make every effort to publicise material both in this magazine and on the VKHAM and WIA web pages. I think that this latter is now important if we are to support the growth of a national WIA.

One issue that has arisen in recent months (and to a lesser extent in previous years) is conflicts between some of our contests and AR Clubs deciding to hold hamfests.

I shall make every endeavour early next year to publish a list of all VK contests. Once this is known, I hope that Club Secretaries will take the time to check it before deciding on special events. This way, the Club should be able to hold its special day and also enter a team in the local contest.

However, I must say that the dates of the contests, once published, WILL NOT be changed for that year unless there are exceptional circumstances.

Have a very happy Christmas and good contesting in 2005.

**73, Ian Godsil VK3JS**

**26 December 2004 until 16 January, 2005**

**Ross Hull Memorial VHF+ Contest**

*Rules next page*

# Results of the Jack Files Contest 2004

**John Spooner VK4AJS, Contest Manager**

This year saw the end of an era. The 2004 Jack Files Memorial will be the last time this contest will be sponsored by the WIAQ. As of yet I have not spoken to anyone about the continuation of this contest; I'm sure it will continue, but not under the umbrella of the WIA.

Unfortunately this year revealed a poor show of support for this contest which has been a proud part of Queensland's amateur radio history in honour of Jack Files, a long-serving councillor of the WIAQ. I'm unsure as to the reasons why there has been a decline in the number of amateurs who wish to participate. I wonder what it would take to grab the interest of Australian amateurs? If you have any ideas they would be gladly received.

All that aside, the results for The Jack Files Memorial Contest 2004 are as follows: -

| | |
|---|---|
| VK4 Single Operator Phone | VK4ADV - Peter De Voss of Asply, Brisbane |
| VK4 Club Station | VK4BAR - Bayside Amateur Radio Club |
| VK2 Single Operator Phone | VK2LCD - Chris Meagher |
| VK3 Single Operator Mixed | VK3JS - Ian Godsil |

So there it is for 2004. I would like to congratulate the winners and to thank all who participated and entered their logs. The listed winner's certificates will be sent as soon as possible.

**73, John Spooner VK4AJS**

# Ross Hull Memorial VHF-UHF Contest 2004 - 2005

**John Martin (VK3KWA), Contest Manager**

It has been some years since there were any major changes to the rules for this contest. Last year I foreshadowed changes in the hope of encouraging more activity, and the response was positive. So this year's rules are quite different from last year's.

The main problem has been the question of how to achieve a level playing field. Stations with microwave equipment have a scoring advantage over those who don't, and the same applies to stations using digital modes. At the same time, amateurs whose main interest is in microwaves or digital modes tend to stick mostly to these activities and don't spend much time working CW or SSB on the lower bands.

So why not try a new approach? Let's have three different playing fields, so that everyone can pursue their particular interests and still feel that they can have a good chance of making their mark in the section of their choice. Hopefully this will make the contest more attractive to everyone. But in particular I am hoping for more activity from stations that have only three or four bands. This will become more important in future years when more amateurs will have access to the "low end" of these bands.

The three playing fields will be:

| | |
|---|---|
| **Section A:** | VHF - UHF (50 MHz through to 1296 MHz); |
| **Section B:** | Microwaves (1296 MHz and above); |
| **Section C:** | Digital Modes, all bands. |

Hopefully there will also be some built-in levelling in Section A, because 6 metres tends to be more useful in those parts of the country where there is less activity on 1296 MHz - and vice versa. Note that contacts on 1296 MHz can be counted in Sections A and B. The reason is to encourage use of this band by Section A entrants, while recognising that microwave operators are also active on this band.

I would also like to offer the incentive of a "Single Rig Award" for the next contest. A certificate will be awarded to the highest scoring entrant in Section A who makes all contacts using a single radio (IC706, FT847 etc), with a single antenna (no stacked beams) on each band and no linears above 100 watts. To be eligible for this award, simply include a description of your equipment on the cover sheet of your log.

Finally, considering the levels of activity in the last few years, I have relaxed the rule about the use of recognised DX calling frequencies. However I still hope that contesters will leave these frequencies as clear as possible, so that everyone will have the best possible chance of hearing calls from DX stations.

I have included a pro forma cover sheet and scoring table in my posting on the Internet, and it will make my job easier if you follow the layout of this sheet. You can send in your log by post or by e-mail.

## The Contest

The WIA maintains a perpetual trophy in honour of the late Ross A. Hull and his pioneering achievements in VHF and UHF operation. The name of each year's contest winner is engraved on the trophy, and other awards may be made in the various divisions of the contest. The contest is open to all amateurs.

## Duration

**0000 UTC Sunday December 26, 2004**

**to**

**2400 UTC Sunday January 16, 2005.**

***In Eastern Summer Time, that is 11 a.m. on December 26 to 11 a.m. on January 17.***

## Sections

**A: VHF - UHF (50 MHz through to 1296 MHz), non-digital modes.**

**B: Microwaves (1.296 GHz and above), non-digital modes.**

**C: Digital Modes, all bands.**

Digital modes are defined as those in which the decoding of the received signal is done by a computer. Entrants may submit logs for one or more sections.

## General rules

One callsign and one operator per station. One contact per station per band per UTC day. Repeater, satellite and crossband contacts are not permitted. No contest activity is permitted below 50.150 MHz. In Sections A and B, entrants making contact on recognised DX calling frequencies should not occupy these frequencies for prolonged periods. All rulings of the contest manager will be accepted as final.

## Valid contacts

For Sections A and B, entrants must exchange RS (or RST) reports plus a serial number. Serial numbers need not be consecutive. For difficult propagation modes such as meteor scatter, exchange of callsigns plus two further digits is sufficient. For Section C, exchange of callsigns plus two further digits.

## Scoring

Scoring will be based on the best 7 UTC days nominated by the entrant. Each contact will be scored as follows:

**For 2 metres and above,** one point per 100 km or part thereof (i.e. up to 99 km: 1 point, 100 - 199 km: 2 points, etc).

**For 6 metres only,** contacts below 1000 km: as above. Contacts from 1000 km to 2400 km, 2 points regardless of distance. Contacts over 2400 km, 20 points regardless of distance.

The band multipliers are:

| 6 m | 2 m | 70 cm | 23 cm | Higher |
|---|---|---|---|---|
| x 1 | x 3 | x 5 | x 8 | x 10 |

## Logs

Logs must cover the full contest period and contain the following for each contact:

- Date and UTC time.
- Station location (if operating portable).
- Frequency and callsign of station worked.
- Reports and serial numbers sent and received.
- Approximate location or grid locator of station worked.
- Estimated distance worked and points claimed, including the band multiplier.

Separate scoring columns for each band would be helpful.

## Cover Sheet

Logs must be supplied with a cover sheet containing:

- Operator's callsign, name and address.
- Station location (if different from the postal address).
- Section(s) entered, and a list of the UTC days to be scored.
- A scoring table set out as the example below.
- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final.

Please use the following format for your scoring table. If you wish you can crosscheck by adding the daily totals across the table, but please make sure that you include the separate band totals.

| Date | 6 m | 2 m | 70 cm | 23 cm | etc |
|---|---|---|---|---|---|
| Day 1 | xxx | xxx | xxx | xxx | xxx |
| Day 2 | xxx | xxx | xxx | xxx | xxx |
| etc. | | | | | |
| Total | xxx + | xxx + | xxx + | xxx + | xxx |

= xxx (GRAND TOTAL)

A sample cover sheet and scoring table has been included in the postings on WIA web sites and the VK-VHF e-mail reflector. Copies can also be obtained from the e-mail address given below.

## Penalties

Minor errors in distance estimates or calculations may be corrected and the score adjusted. Prolonged use of recognised DX calling frequencies (especially when the reports indicate strong signals) may incur a scoring penalty. Inclusion of any false log entries will lead to disqualification.

## Entries

Paper logs may be posted to the Manager, Ross Hull Contest, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to jmartin@xcel.net.au. The following log formats are acceptable: ASCII text, Office 97 RTF, DOC, XLS or MDB. If you use Office 2000 or later, please save the files in Office 97 format.

*Logs must be received by Monday, February 7, 2005. Early logs would be appreciated.*

## Note on calculating distances

Absolute accuracy is not required. You just need to know whether each station is above or below the nearest multiple of 100 km, so you can use a compass to draw 100 km circles around your location on a map. A more accurate method is to use six-digit Maidenhead locators and a program that can be obtained from the e-mail address given above. The program is called DXLOCATE version 2.1. (There is a version 2.2 in circulation, but it has a minor bug! Version 2.1 does the same job, but without any bugs.)

# Summer VHF-UHF Field Day 2005

**John Martin VK3KWA, Contest Manager**

## Dates

*Saturday and Sunday January 15 and 16, 2005.*

| | |
|---|---|
| **Duration in all call areas other than VK6:** | **0100 UTC Saturday to 0100 UTC Sunday.** |
| **Duration in VK6 only:** | **0400 UTC Saturday to 0400 UTC Sunday.** |

## Sections

A: Portable station, single operator, 24 hours.

B: Portable station, single operator, 6 hours.

C: Portable station, multiple operator, 24 hours.

D: Portable station, multiple operator, 6 hours.

E: Home station, 24 hours.

Single operator stations may enter both Section A and Section B. If the winner of Section A has also entered Section B, his log will be excluded from Section B. The same applies to the winner of Section C if the station has also entered Section D.

## General Rules

A station is portable only if all of its equipment is transported to a place that is not the normal location of any amateur station. Operation may be from any location, or from more than one location. You may work stations within your own locator square. Repeater, satellite and crossband contacts are not permitted.

One callsign per station. If two operators set up a joint station with shared equipment, they may choose to enter Section A or B as separate stations under their own callsigns, or Section C or D under a single callsign. If they enter Section A or B, they may not claim contacts with each other. Stations with more than two operators must enter Section C or D. Operators of stations in Section C or D may not make any contest exchanges using callsigns other than the club or group callsign.

No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for any contest activity. Suggested procedure is to call on .150 on each band, and QSY up if necessary.

## Contest Exchange

RS (or RST) reports, a serial number, and your four digit Maidenhead locator.

## Repeat Contacts

Stations may be worked again on each band after three hours. If the station is moved to a new location in a different locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

## Scoring

For each band, score 10 points for each locator square in which your station operates, plus 10 points for each locator square worked, plus 1 point per contact. Multiply the total by the band multiplier as follows:

| 6 m | 2 m | 70 cm | 23 cm | Higher |
|---|---|---|---|---|
| x 1 | x 3 | x 5 | x 8 | x 10 |

Then total the scores for all bands.

## Logs

Logs should cover the entire operating period and include the following for each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed.

## Cover Sheet

The cover sheet should contain the names and callsigns of all operators; postal address; station location and Maidenhead locator; the section(s) entered; the scoring table; and a signed declaration that the contest manager's decision will be accepted as final.

Please use the following format for your scoring table. In this example the operator has operated from one locator and worked four locators on each band:

| Band | Locators activated (10 points each) | + | Locators worked (10 points each) | + | QSOs (1 point each) | x | Multiplier | = | Band Total |
|---|---|---|---|---|---|---|---|---|---|
| 6 m | 10 | + | 40 | + | 40 | x | 1 | = | 90 |
| 2 m | 10 | + | 40 | + | 30 | x | 3 | = | 240 |
| 70 cm | 10 | + | 40 | + | 20 | x | 5 | = | 350 |
| **Overall Total** | | | | | | | | = | **680** |

A sample cover sheet and scoring table has been included in the postings on WIA web sites and the VK-VHF e-mail reflector. Copies can also be obtained from the e-mail address given below.

## Entries

Paper logs may be posted to the Manager, VHF-UHF Field Day, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to jmartin@xcel.net.au. The following log formats are acceptable: ASCII text, MS Office RTF, DOC, XLS or MDB. If you use Office 2000 or later, please save the files in Office 97 format.

*Logs must be received by Monday, February 7, 2005. Early logs would be appreciated.*

# 24th ALARA Contest

### 28/29th August, 2004

| | | |
|---|---|---|
| Gwen VK3DYL | 562 | Top score overall, Top VK YL,Top phone, Top VK3 member |
| Shirley VK5JSH | 249 | Top VK5 member |
| Judy VK3AGC | 208 | |
| Peter VK3DI | 200 | Top VK OM |
| Robyn VK3WX | 142 | |
| Marilyn VK3DMS | 114 | (CHECK LOG) |
| John VK3MGZ | 110 | |
| Christine VK5CTY | 109 | |
| Bev ZL1OS | 106 | Top ZL member |
| Elizabeth VE7YL | 84 | Top VE member |
| Bron VK3DYF | 78 | |
| Pat VK3OZ | 73 | |
| Dot VK2DB | 68 | Top VK2 member |
| Margaret VK4AOE | 56 | Top VK4 member |
| Ralph VK2IRP | 45 | |
| Chris VK2LCD | 39 | |
| Minnie VE3DBQ | 28 | |
| Alan VK8AV | 15 | |
| **SUMMARY:** | | |
| VK Alara members | | 10 (Includes 1 check log) |
| VK OMs | | 5 |
| DX Alara members | | 3 |
| Total logs | | 18 |

This year was much more successful, both from the conditions and the numbers taking part. Even then there are a number of members and OMs who appear in the logs, but who never sent in their own log. It really doesn't matter how small the log is - PLEASE send them in, as every one counts towards making the Contest even more successful.

This year, as the requirement for CW has been removed, the Florence McKenzie trophy has been retired from the Contest. However working CW in the Contest still counts for double points, so it can be very worthwhile.

As always it was great to hear the OMs giving the girls points, and congratulations go to Peter VK3DI for a magnificent score. Conditions between New Zealand and Australia were just not favourable this time, so Bev ZL1OS must be commended for her effort. Better luck next year ZL girls!

Gwen VK3DYL is our most consistent and successful Contest entrant, and again has made an excellent score. Another great win, Gwen. Shirley VK5JSH must also be commended for a first time entry and an excellent score.

There could be some changes in the Contest rules for 2005, so be sure to check in the ALARA Newsletter or AR to make sure of the correct procedure.

The Contest will be held on the weekend of August 27/28, 2005, so make sure that date is in YOUR diary.

I will look forward to hearing everybody in next year's Contest, if not before.

**33 Marilyn VK3DMS**

Bill Magnusson VK3JT

## "Keps" situation becomes clearer

Dr Tom Kelso of the Celestrak web site has been regularly updating the information on his site regarding the future availability of keplerian elements for the range of satellites of interest to amateurs. On 6th of November the latest update appeared and included links to downloadable (.pdf) files provided by Lt Col Maloney. The material was presented at the Space Operations Safety Workshop held in October. You can go directly to the page by typing in the following URL. http://celestrak.com/NORAD/elements/notice.asp

The page scrolls down to the various updates with the most recent at the bottom. There are several interesting links explaining the current situation and plans for distribution of "keps" via something called the "Commercial and Foreign Entities Support Pilot Program". Complicated name but I think that means us! The .pdf files make interesting reading with the whole process described using flow diagrams. In essence it looks as though nothing much will change as far as amateur radio users are concerned. The major impact being on the next level up. That is - operations like Tom's "Celestrak" web site. All previous users have been registered and it looks like there will not be any hold-ups so the "Celestrak" web site will most likely continue business as usual. Good news for us.

## C-C Rider. What is it?

The C-C Rider Payload is a cutting edge concept being worked on by a design team as we speak. It was first put forward by Tom Clark W3IWI and the idea has developed and firmed under the direction of Rick Hambly W2GPS and Phil Karn KA9Q. It is hoped that C-C Rider will be developed in time to be included in the Eagle satellite.

It will include elements of four previously separate proposals:

- KarnSat (~1 Mbps),
- C-C Rider (5 GHz Band),
- Software Defined Radio, and
- IP in Space

This will be a totally new technology to the Amateur Satellite Service that is directed at putting access to high orbit satellites into the hands of the average Ham even for those living in apartments and restricted communities. It will do this by using modern digital techniques, in the main a digital carrier with advanced error correcting codes. Applications will be those familiar to the average operator. Voice, data and video, either in one-on-one and/or round table group conversation modes. When fully developed it promises high speed data rates up to 1 Mbps with Internet Protocol, software defined radio and tiny antennas operating in the 5 GHz band. Keep your eye on this concept, it could be a big step into the future for amateur radio satellites. If it all sounds a bit like a 'black art' to you, I suggest you get on the web and type C-C Rider into Google and read up on it.

### The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

### AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

## Jupiter and amateur radio satellites

No, AMSAT doesn't have plans to orbit the planet Jupiter with an Oscar. This topic came up recently in discussions on the bulletin board. There has been serious discussion regarding the inclusion of the old HF modes in future satellites.

A great number of new amateurs come up through the novice ranks in many countries and therefore have HF experience and equipment. It's thought by some that 21 MHz and 29 MHz represent an easy way for newcomers to enter the satellite game. This opinion has gained quite a following and indeed satellites launched in the last few years have included these bands among their transponders.

An interesting question was raised about interference. In general interference questions are concerned with earth-bound sources such as radar and other amateur services such as weak signal segments and the like. This question concerned a potential extra-terrestrial source of interference to the satellites and conversely the potential for amateur up link signals to interfere with radio astronomy.

The planet Jupiter has been known for many years as a source of radio emissions. They take the form of noise bursts, sometimes staccato in nature, sometimes having a longer period akin to waves crashing on a beach. The emissions are called "Jovian Decametric Noise Bursts". In brief they are caused by interaction between Jupiter's magnetic field and its moon Io.

For eons of time Io's volcanoes have been spewing out matter and because of the moon's low gravity some of the matter escapes, trailing behind Io and forming into a "torus" following Io's orbit. Io orbits through this torus.

The interaction between the charged plasma in the torus, Io's movement through it and Jupiter's magnetic field causes the noise bursts.

The above is a much condensed explanation and more detail can be gleaned from John Kraus's book "Radio

Astronomy" and many www sites. The noises fall into several categories and at their peak they can certainly be heard on Earth on short-wave receivers using modest antennas.

But how strong are these emissions? Could they be received by an amateur radio satellite with an HF up link and relayed by the downlink back to an earth station again?

A good question. The noise bursts are not confined to a narrow band of frequencies. They are quite broad band in nature. The usual listening frequency of 18 – 22 MHz is selected more for freedom from man-made noise than because of the noise peaking in that part of the spectrum. It in fact peaks broadly around 10 MHz but that is a very busy part of the short-wave spectrum so most listening is done around either 18 or 22 MHz.

The noise is detectable (on large arrays and satellite monitors) right up into the VHF region. Jupiter and its moon Io form a kind-of giant rotating beam antenna that sweeps the noise signal past Earth as the system rotates.

The Earth is not always directly in the path of this beam. The strength of the noise bursts vary considerably with the "Jovicentric Declination of Earth". That is, the position of Earth in Jupiter's sky, which varies from around +3 degrees to around -3 degrees of Jupiter's celestial equator in a roughly sinusoidal pattern with peaks every 12 years or so.

There are smaller "seasonal" peaks as well. When the JDE is around +3 degrees we receive strong bursts of noise. The last peak occurred around 1999/2000 and we are "on the way down" the slope, much as we are in the current sunspot cycle.

Incidentally the two cycles are not related and in fact get out of sync every few decades. You will need quite an elaborate antenna system to receive the Jovian noise at present and you certainly need computer modelling to predict when the conditions are favourable.

I don't have any data at hand on signal strengths outside the ionosphere at satellite height but the research has been done and for those who love numbers I suggest John Kraus's "Radio Astronomy" would be a good place to start. It has a comprehensive section on Jovian noise. From what I've read and experienced myself, I doubt it would pose any threat to amateur satellite communications. Actually the cyclic nature of the long duration noise bursts with their period of several seconds would make it difficult to identify on a satellite downlink as it could easily be confused with tumbling QSB. I don't believe it should concern amateur radio satellite designers but it's certainly an interesting question. Perhaps one day some one listening to a satellite down link will successfully identify the Jovian noise as riding through an HF satellite transponder. (now there's an interesting project).

The question of whether or not amateur transmissions using an HF up link to a satellite could or would interfere with a radio astronomy program studying the Jovian Decametric noise is quite different. They would not be any more or less likely to cause a problem than the myriad of other signals in the 21 MHz band.

## SSETI Express project latest

The SSETI project team consists of Sam G4DDK, David G0MRF, Jason G7OCD, Howard G6LVB and Graham G3VZV.

The transmitter uses a power amplifier that has been provided free of charge by Charlie, G3WDG. This report from the team outlines the current progress and plans regarding SSETI Express – the first satellite to be built under the auspices of the ESA Education Office for the Student Space Exploration and Technology Initiative.

The Flight Model of the AMSAT-UK S band transmitter module has been completed and installed into the special enclosure which has been provided by the Wroclaw University of Technology in Poland.

The satellite will use three S band RHCP patch antennas. These antennas are fed through a splitter unit that provides 50% of the power to the nadir facing antenna and 25% of the power to each of the other antennas that are being fixed to the side of the spacecraft. These antennas and the splitter have also been provided by the University. Tests performed on the flight model transmitter indicate that the total power output in 2401.840 MHz should be just over the intended 3 watts.

On November 8th the team will be taking the transmitter to the ESA ESTEC facility in the Netherlands. The unit will be tested to work with the on-board computer, the 28 V dc power supply system and also the 70 cm transceiver that is being provided by Holger DF2FQ. They are looking forward to this work being completed by midweek and being able to formally "hand over" the unit to the ESA SSETI team at that time.

Future project plans for the SSETI Express project call for final integration of the complete spacecraft to be completed at a full SSETI team workshop being held at the end of November and for it then to proceed to "thermal, shake & vac" tests during December and January prior to delivery to the Plesetsk launch site for a May 2005 launch.

The AMSAT - UK S-band transmitter will be used to downlink 38k4 telemetry and image data during the early part of the mission. When this part of the project has been completed it is intended that it will be switched to provide a single channel U/S FM transponder.

The transmitter also has its own simple, in-built, telemetry system to provide health check data and suitable decoding software is under development and will be released before launch.

ESA is also very keen for radio amateurs worldwide to be involved in the collection of all the AX25 mission telemetry data both at 38k4 on 2.4GHz and at 9k6 on 437 MHz.

Obviously a worldwide network of ground stations is something that is usually only available with a large investment. Nearer the time of launch further information will be made available concerning this important part of the project.

ESA will be awarding a prize for the amateur who provides the largest amount of this data to them. For more details of the SSETI Express project visit http://sseti.gte.tuwien.ac.at/WSW4/ and click on "missions" then "express". This site includes more than 120 photos of the integration process, detailed drawings, progress reports and a live webcam.

THE
CENTRAL COAST
FIELD DAY

Wyong Racecourse Sunday 20th February 2005

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THE CENTRAL COAST AMATEUR RADIO CLUB INC.
For further information
Web: www.ccarc.org.au. Phone 02 4340 2500
email: vk2afy@hotmail.com

## PCsat - still alive and active

This satellite has really had a chequered history over the last couple of years. It's been declared "dead" a couple of times but seems to bounce back.

This late notice from Bob Bruninga WA4APR indicates it is still usable with some constraints:

"PCsat is still fully operational on daytime passes and has been since 16 October. She is now just about back to maximum eclipse season with 33 minute eclipses every 100 minutes, but still working fine. As long as we remember to send her a keep-alive command at least once every 72 hours, we think she will remain healthy. So enjoy PCsat, but DO NOT OPERATE IN THE DARK. That will kill her batteries and probably cause a reset back to OFF for several months".

PCsat works just like a normal APRS digipeater but on a frequency of 145.825 MHz rather than the usual APRS network frequency and orbiting with an altitude of over 485 miles rather than residing on a hilltop somewhere. The software responds to RELAY, WIDE and ARISS just as most APRS nodes do.

PCsat was designed and constructed at the US Naval Academy under the guidance of Bob WB4APR. PCsat2 is awaiting launch and is designed to take the APRS satellite experiment a further step forward. The shuttle is expected to return to flight in May 2005.

When launched, STS-114 will carry the external ARISS payload, PCSAT2. This will be carried on the backside of a Materials International Space Station Experiment (MISSE5), and will include 3 transponders, APRS Packet, FM Voice, and 10 m PSK-31.

A website detailing this project. "PCSAT2 - External ISS Experiment in the Amateur Satellite Service" can be found at: http://web.usna.navy.mil/~bruninga/pcsat2.html. Again - please use caution when operating through PCsat. The eclipses are a real problem with the present state of the batteries and solar cells. Most tracking programs will tell you if and when a satellite is due to undergo a series of eclipses.

## GO-32 TECHSAT-1B

At the time of writing, the BBS on Gurwin Techsat -1B has been turned off for maintenance. Roni Waller, 4Z7DFC of Techsat-1B administration reported that the BBS would be off for some time and unfortunately as a result files would be lost. WiSP should allow users to easily recover from this situation but you may need to empty some directories and allow it to start again.

The currently operating satellite summary will appear in the February 2005 issue.

# VHF/UHF – an expanding world

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Leigh Rainbird VK2KRR – vk2krr@telstra.com

## Weak signal

**David Smith - VK3HZ**

October was a fairly quiet month propagation-wise. On the morning of October 23rd, a high-pressure cell settled over central Victoria producing some enhancement. Joe VK7JG worked Peter VK5ZLX and Leigh VK2KRR, both on JT65b digital mode. Joe was a very good signal in Melbourne and managed several voice contacts without any problems. To the west, Garry VK5ZK also managed a voice contact to Nhill to Bill VK3LY and into Melbourne with VK3HZ. And that was about it for tropo openings.

### Auroral openings

On the afternoon of November 8th, a substantial auroral opening occurred following a mass ejection from the Sun. The opening was first noticed around 0400Z and it continued until well past 0800Z. A message posted to the VK-VHF Reflector seemed to bring out stations from near and far – all the more amazing given that it was a work day. On 2 m, there were many very strong signals, dogpiles on 144.1 and many contacts occurring simultaneously between 144.1 and 144.2.

Robbie VK3EK in Bairnsdale reports working VK3DOU, ZL3TY, VK3AJN, VK1ZQR, VK2BZE, VK2ZOM, VK4ZRT and JA8NAE on 6 m. On 2 m, he worked VK3UH, VK1ZQR, VK2BZE, VK3HZ, VK2EI, VK2TWR, VK2KRR, VK2UBF, VK2TWB, VK3KOS, VK2GKA, VK7MO, VK3KEG, VK3XPD, VK3CAT, VK3BJM and VK5DK. On 70 cm, he worked VK2BZE and VK2TWR. He reports hearing many more stations also.

Neil VK2EI at Port Macquarie reports that between 0420Z and 0520Z, when he had to go out, he worked VK3HZ, VK3EK, VK3DUT, VK2TWR, VK3KAQ and VK3UM.

Brian VK5UBC at Gawler reports that on 2 m, he worked VK3GOM, VK3UM, VK2KRR, VK3KEG, VK5DK, VK5NC and VK3HZ. On 6 m, he worked several VK3 and VK4 stations via aurora. He also worked Jeff VK8GF in Alice Springs.

Colin VK5DK reports that, despite struggling with a very sore throat and vocal chords (very hard to tell with auroral contacts), he managed to work the following stations on 2 m: VK3HZ, VK3UM, VK3BJM, VK3BG, VK3KAI, VK3DUT, VK3UH, VK3DDU, VK2GKA, VK3KEG, VK3EK, VK5UBC, VK2KRR, VK1ZQR and VK3GOM. On 70 cm, he worked VK3HZ and heard VK2FZ.

David VK3HZ worked 23 stations on 2 m via aurora including: VK1ZQR, VK2KRR, VK3DUT, VK2TWR, VK2EI, VK3BG, VK3EK, VK2BZE, VK2TWB, VK7BBW, VK2UBF, VK7MO, VK2GKA, VK7ZOO, VK3KEG, VK2FZ, VK2FLR, VK5DK, VK3UM, VK3ZQB, VK5UBC, VK5NC and VK5ZLX. He also heard at least another 9 locals including: VK3XPD, VK3KAI, VK3KAQ, VK3DDU, VK3UH, VK3KOS, VK3BJM, VK3GOM & VK3AUU. On 70 cm, he managed to work VK5DK and VK2FZ. The Adelaide, Mt Gambier and Nimmitabel 2m beacons were all clearly audible via aurora.

Then on November 10th, from about 2130Z to 2300Z, and from 0700Z to 1000Z, more auroral openings occurred. These were weaker than those of the 8th, and fewer stations were on the bands. During these openings, Rex VK7MO ran test transmissions on 2 m for others to observe the behaviour of the Doppler shift on his signal. Doug VK3UM, David VK3AUU and David VK3HZ all reported negative shifts of 300 - 400 Hz during the morning opening, and positive shifts of the similar magnitude during the evening. However, the shift would sometimes reverse polarity and the spread of the signal would vary. At times, multiple Doppler-shifted signals were observed with differing shifts. Towards the end of the opening, the shift seemed to cycle between positive and negative over a period of about a minute, before the auroral enhancement finally disappeared. Further observations are planned, when next we get an auroral opening.

### Spring VHF/UHF Field Day

The Spring VHF/UHF Field Day was held over the weekend of 6-7 November. In VK3, it was fairly quiet. I operated from home on 2 m, 70 cm and 23 cm and worked 27 different stations.

Not many stations were heard out in the field - only one "club" / multi-op station being VK3QM near Geelong – operators were Chas VK3PY, David

Gavin VK3HY at Mt Terrible during the Spring VHF/UHF Field Day

VK3XLD and others. Several other single-op stations braved the elements - Jim VK5OM/P3 (ex-VK3AEF, Nhill), Gavin VK3HY (Mt Terrible in central Vic), Ken VK3YDK (Neerim South), Peter VK2BIT (near Young), and Rex VK7MO (Mt Wellington). Radio conditions were flat - Roger VK5NY was worked, but with a struggle. Virtually no stations were worked from the west of the state / Mt Gambier, and east Gippsland was also very quiet.

There seemed to be several reasons for the low turnout. The most obvious was the weather, which was, in a word, appalling! It rained fairly constantly and was quite cold. A similar thing happened last year, if I recall correctly, where Gavin VK3HY had snow on Mt Terrible. The other main issue was that several Hamfests were also held over the same weekend, attracting many away from their radios. Hopefully, with the revitalised WIA putting efforts into a national events calendar, we can avoid such clashes in future.

## Beacons

Adam VK4CP has been working hard, adding features to the excellent VK/ZL Logger - http://vklogger.brizwebz.com.au/ One feature that will be online by the time you read this is the Beacon Status page. This page contains up-to-the minute information on all VK/ZL VHF/UHF and microwave beacons and includes several fields of information that are not currently available from the Callbook or online. The Ident field contains the Ident type (CW/FSK), period and, for FSK, keying frequency offset (e.g. CW 60s, FSK +800 Hz 30s). A Comments field is available for noting things like actual frequency and any unusual keying arrangement (e.g. only keys for 12 sec on the 5 mins).

Another important field is the 6-digit grid locator for the beacon. A planned future enhancement is that, if you have entered your grid locator on the OpInfo page, you will be given a customised display showing distance and bearing from your QTH to each beacon. The 6-digit grid locator is needed for accurate distance/bearing calculations - particularly important for microwave beacons.

Obviously, such a page is only as good as the information it contains. Therefore, people are encouraged to enter data on beacons, but please only do so for beacons that you can currently hear, or for which you have current, first-hand information – data from an opening 6 months ago is of little use.

Rod VK2TWR at Kings Cross near Cabramurra

Roger VK5NY, on behalf of the VK5 Beacon Group, reports that Mark VK5AVQ has been busy upgrading the VK5VF beacons at Mount Lofty and also moved the 10 GHz beacon to a less-obstructed location. The old antenna (slotted waveguide) was not working well and was replaced with another built by Des VK5ZO in the change. The new location is perfect for microwave beacons with a clear horizon to the west towards VK6 and a good take off to the east towards Melbourne. The frequency does shift a little so tune either side of 10368.450. Field checks show a vast improvement to the east.

The VK5VF 1296.450 beacon at Mount Lofty at 8 W output should also provide good coverage. Once again the frequency is not spot on – currently it's about 2 kHz low. Plans are afoot to possibly Reflock the beacon, but time is always a problem.

The VK5VF 6 m beacon on 52.450 is currently off air. The PA has expired and will be fixed soon, when time permits.

Many thanks to Mark VK5AVQ (new beacon minder), to David VK5KK for all the previous construction work and to others for their component donations.

Please send any signal reports to Roger at vk5ny@picknowl.com.au

## EME

The first leg of the ARRL EME contest was held over the weekend of the 9th-10th of October. Active VK stations included Trevor VK4AFL and Doug VK3UM, both operating on 70 cm. Doug reports that he worked a total of 36 stations over the weekend. "It was interesting that I was transmitting and receiving vertical into Europe and the USA as Faraday was almost 90 degrees and quite sharp. (Others with the more accurate measuring techniques confirmed this). All CW of course no loggers, spotting, or skeds. I ran out of time for stations that were present but hopefully will catch them in December. Activity down on previous years but much improved over previous months. Several new stations worked and a new country."

Another new face on digital EME is Ron VK6KDD. Apparently VK6 is fairly rare on EME, so Ron could find himself busy. Using only a single 12-element M2 yagi, Ron managed to work Joop PA0JMV on the 2nd of November. Unfortunately, Ron suffered some equipment damage soon afterwards but will be back trying for further contacts in the near future.

## 5.7 GHz band status

As mentioned a few months ago, the ACA has been evaluating a proposal to introduce apparatus licensing arrangements in the 5725-5825 MHz band that could allow greater opportunities for broadband wireless access services in regional and rural areas of Australia. The results of this ACA review have recently been announced, and represent a significant win for Australian amateur radio operators. Amateurs retain unencumbered access to the 5760 MHz band, which is currently used for weak signal applications. A proposal to use the amateur allocation for commercial services was rejected by the ACA.

Please send any Weak signal reports to David VK3HZ at vk3hz@wia.org.au.

# Digital modes

**Rex Moncur – VK7MO**

During October VK7MO undertook a DXpedition to outback VK5 and VK8 activating 14 grid squares and completing 5 EME (JT65) and 105 meteor scatter contacts (FSK441) on two metres. Contacts were completed on meteor scatter with VK1WJ, VK2AWD, VK2EAH, VK2FLR, VK2FZ, VK2KRR, VK3AFW, VK3AXH, VK3CY, VK3FMD, VK3HZ, VK3II, VK3KAI, VK4TZL, VK5DK, VK6AO, VK6HK, VK7JG, and VK8RH. Stations seen but not worked on meteor scatter were VK3KQB, VK3ZYC, VK4CDI, VK6KDD and VK8GF. Typically 8 to 10 stations were worked in a few hours each morning. It was good to see all states and mainland territories participating.

As predicted by theory, meteor scatter worked well in the range 1000 km to 1800 km with contacts becoming very difficult above 2000 km or below 700 km. The data from the meteor scatter contacts was used to compare the performance of a small 2.3 wl yagi and a 6 wl yagi. While it was not apparent at the time, a detailed analysis showed that at distances below 1650 km the shorter yagi is to be preferred because of its greater beamwidth, but that the longer yagi has an advantage at distances beyond this.

Please send any Digital Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

# 2 m & 70 cm FM DX

**Leigh Rainbird - VK2KRR**

Tropospheric Propagation was 'on the boil' in Queensland during October, and this was our main area of propagation. There were only a few tropo openings in the southeast to speak of and most were overshadowed by the significant activity happening in Queensland.

After keeping his eye on all the charts and indicators, Mike VK4MIK on the Atherton Tablelands, came across an opening on the 6th where he ended up working as far as the Hodgson Range repeater. This is quite a mountainous path and Hodgson is to the SW of Mackay. Also around the same time, Felix VK4FUQ at Ingham was working into the Mackay repeater and the Hayman Island repeater with almost full-scale signals. David VK4DJC on Hayman Island was able to hear Felix direct at times, but no simplex contact was completed.

Down to the southeast on the 9th, an opening saw signals passing between VK2, 3 and 5 on 2 m but nothing much on 70 cm. This was one of those openings where the signals had QSB and poor unstable signals. At VK2KRR signals peaked around 7 am with the higher repeaters around the Adelaide Hills being present at some time or other. The furthest repeater heard was VK5RLH in the central north at 833 km. Garry VK3KYF was heard working the Mt Macedon VK3RMM repeater from Mildura.

Good news for those looking for propagation indicators and an east west link, is that the Grampians VK3RWZ 146.950 repeater is now back into full steam ahead mode after being in a temporary state for a year or more. It is reported that the coax and antenna have been replaced. Reports of monster signals are now emanating from many miles around and I believe that before its demise a few years ago, it was worked by stations located in Western Australia.

On to 13th October, and a great long path was workable by some along the VK4 coast. Both Mike VK4MIK and Felix VK4FUQ were able to hop into a duct which dropped them off at Amy's Peak VK4RGA. Responding to the calls from the distant stations were not only Mike VK4JOO not too far away in Gladstone, but also an unexpected call in from Kevin VK4BKX, 371 km south in Toowoomba. The distance for Mike to the repeater worked out at a whopping 951 km! And for Felix a big 805 km. For Mike the 1000 km barrier was now in sight.

On the 11th, Karl VK7HDX was able to work 502 km across the water from Launceston to the Mt Macedon repeater on the north side of Melbourne where he caught up with Gavin VK3VTX. Karl mentions he could access a few other VK3 repeaters but no one was about to answer the call.

A very interesting report was received from Don VK6HK in Perth, relating to some very unusual conditions during 19th October along the VK6 coast.

In the morning of the 19th, Phil VK6ZKO in Perth first reported hearing Indonesian FM simplex signals across the 2 m band.

Glen VK6IQ and Don VK6HK (and maybe others) also copied Indonesian language (a female operator) traffic via the output of the Cataby 2 m repeater 147.200 in Perth around 0100Z and earlier. Glen 6IQ at Wandina northeast of Perth copied the signal on the repeater input. There was no indication that the DX operator copied or was even listening to the repeater output or input. Signals into the repeater suffered QSB but ranged up to noise free. Distance from the repeater site to the most likely origin of Indonesian signals is 2700 km and to VK6ZKO is 2850 km. Unfortunately no AR related transmissions or callsigns were heard.

The Indonesian activity on the VK6RCT repeater was repeated again in the evening with the reappearance of Indonesian transmissions albeit at reduced strength. As far as is known, these signals are the first reported Indonesian based signals on 2 m into Perth.

The big VK4 tropo boil over occurred on the 25th with Mike VK4MIK reporting some big distance along the coast. The best ones being to Amy's Peak at 951 km; Springsure at 793 km; Gympie at 1231 km; Bundaberg at 1118 km and Hervey Bay at 1151 km. Well done to Mike for breaking the 1000 km barrier to several sites.

Also during this significant opening, Wayne VK4ZRT in Gladstone was able to work the Cairns repeater and speak to some of the locals over a big 954 km path. Wayne also took part in the big one, where he spoke to VK4MIK through the Gympie repeater which is 310 km south. Wayne worked Wal VK4AIV in Mackay on FM simplex which is 367 km and also found the Hodgson Range 438.500 repeater at 350 km.

Felix VK4FUQ also stepped in on the action and made it to Amy's Peak at 805 km; Hodgson Range at 491 km; and Springsure at 639 km. Felix could hear Rockhampton at 694 km, but could not access.

There was again an opening on the 28th where similar areas were worked, but not quite as extensive or as easily as was found on the 25th.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@telstra.com.

**ar**

# Beyond our shores

David A. Pilley VK2AYD
Davpil@midcoast.com.au

My apologies for no "BOS" last month, but your scribe was beyond our shores visiting with friends around the globe. I'd like to share a few of subjects I discussed with other Radio Amateurs.

## BPL vs WiFi

Living in rural Australia I don't get so involved with new technologies that are used from day to day in the major cities. Over the past year there has been much concern on the effects of power line communications using broadband HF radio and the effects it could have on amateur radio frequencies. Tests have been carried out here in Australia and world-wide. The effects have been quite devastating with HF radiation reaching intolerable levels. I had no idea of the level of use of WiFi in the USA until I attended a 300th birthday party for the house where Dick, W4AOP and Meredith,W4AMK live. Their home that was built in 1704 during the William Penn era is located in a beautiful 50 acre setting in Bucks County, Pennsylvania. As there were some 40 radio amateurs amongst the 240 guests that were attending the celebration, 20 of which were in motor homes (RV's), Dick, W4AOP, provided a WiFi system that covered 100 metres radius from the main house, which provided 24 hour Internet access. What shocked me was the speed of the system to which it was connected, 54 Mbps. Yes 54 Mb. (I thought of my old dial-up system back home which, with luck and good weather I can reach 33 kbps). Around a social evening of the amateurs we discussed BPL and WiFi. The consensus was BPL, from a scientific point of view, has to be investigated, but no one saw any future for it, other than switching on lights around the town. Not a very helpful comment, especially with the FCC and ARRL deeply engrossed in discussions and our own WIA and ACA endeavouring to finalise specifications. Wherever it is tested it should be closely monitored for interference radiation.

WiFi was considered the in-system. In Spokane, Washington State, WiFi covers over 220 square miles. I read in the newspaper that Philadelphia was offering free WiFi for 1 mile radius of the CBD and hoped to cover the entire city by 2006. I was later up state at Hanover, the home of Dartmouth College and at lunch time saw all the students sitting around in the park with laptops, directly connected to the college WiFi system. I found other friends that had children with their individual laptops also had WiFi fitted in their homes. It seemed to be everywhere. Here in Australia we already have WiMax that operates on 3.43GHz and is said to cover an area of 2,000 sq.km. The way ahead is wire-less – let's hope they have one worldwide system that is compatible to all.

## Frequency congestion

No, I'm not talking about 80 metres! A dear friend of mind, Jay Gerber, N3AW, is a legend with NFL Films. Amongst his responsibilities, Jay is involved with frequency congestion at football games. For example at the Super Bowl there are over 1,200 channels of communication in use. They need to be co-ordinated. In American football the Coach has direct communication by wireless with the Quarter-Back. You can imagine the Coach telling the QB where to pitch the ball when a voice pipes in and says "one hamburger – hold the pickles". No it hasn't happened, but it could!

In the U.S.A. each big city/region has a volunteer frequency co-ordinator who is a member of the Society of Broadcast Engineers. Many of these are Radio Amateurs. They are responsible for co-ordinating broadcast frequencies in a given area, however, there is no one who co-ordinates the entire spectrum. Here is where the Football League ran into problems and special frequency co-ordinators were created. Their interest is from DC to light! They are not interested in licensing or whether a station is legitimate (that is the responsibility of the FCC), their prime concern is to ensure there is no frequency clashes and to help everyone do their job. It didn't sound too hard until Jay explained that weeks before a big game they have to investigate all the frequencies that were already being used by public and commercial services in the immediate area. It is no good the TV outside broadcast turning up and finding their crystal locked frequencies were already occupied. I was amazed to learn the Chief Coach may have an 8 (or even 16) channel transceiver to talk to the Side-line Coaches, Quarter-Back, etc. Those helmets the QBs wear are full of electronic gear!

I realised that our Football games were nowhere as sophisticated as the U.S., however I did wonder who co-ordinated the Olympics in Sydney. There must be a story there?

## Saudi Arabia

### HZ1AB permanently QRT

The Dhahran Amateur Radio Club has been permanently shut down. This, as the result of telecommunications regulatory changes in Saudi Arabia.

For close to sixty years the Dhahran Amateur Radio Club operated station HZ1AB. Club Secretary Thomas Carlsson, AB5CQ reported that due to revisions made in Amateur Service licensing requirements by the Saudi Arabia Communications and Information Technology Commission, operations were no longer possible.

The HZ1AB callsign has already been reissued to Bandar Salah Al Harby. Carlsson says that the clubs QSL manager, Leo Fry, K8PYD still has all the logs and will process any outstanding QSL card requests.

(WIA News)

## Great Britain

### UK Amateurs Gain 7.1 - 7.2 MHz from 31 October

Ofcom and the Radio Society of Great Britain announced on October 29 that all necessary procedures required for early access to the 7.1 to 7.2 MHz spectrum for all UK radio amateurs have been finalised and that access is allowed from 0100UTC on Sunday 31 October 2004. Early access is granted on a Secondary (non-interference) basis using a maximum of 26 dBW (400 watts) PEP for Full licensees, 50 watts for Intermediate and 10 watts for Foundation licensees.

Notices of Variation for the Foundation, Intermediate and Full licences have been published on the Ofcom website. It was recommended that for the time

being all UK amateurs use only voice and Morse code modes between 7.1 and 7.2 MHz. Band planning issues on 7 MHz will be kept under regular review and will be dependent on the number of administrations granting early access to this band prior to full Primary access on 29 March 2009.

## Great Britain

### First store and forward in UK

Word from the United Kingdom that its first unattended 'store and forward' single frequency voice relay has become operational. It was switched on at 13.30 UTC on Saturday October 16th on 70.4375 MHz in the European 4 metre band. Its call sign is M-B-7-F-M and it has a maximum 'store' time of 120 seconds. The installation is located in the Chiltern Hills with 10 dBW Effective Radiated Power from a dipole antenna 32 metres above ground.

(GB2RS)

## The future

### Scientists predict early solar minimum

And some possible good news for hams tired of the rather poor High Frequency band conditions these days. It comes from the GB2RS News Service, which says that American physicist David Hathaway believes that the next solar minimum could arrive sooner than previously predicted.

GB2RS News quotes on an article on the 'Science at NASA' website. It predicts that the next solar minimum could occur in late 2006. That's about a year earlier than previously thought Dr. Hathaway bases his prediction on data from the last eight solar cycles, which show that solar minimum follows the first sunspot-free day on the sun by 34 months. In this solar cycle, the first spotless day was on 28th January this year and more recently, on 11th and 12th October, there were two more spotless days.

Hathaway goes on to state that the next solar maximum might also come early. He is quoted as saying that solar activity intensifies rapidly after solar minimum. That in recent cycles, the Solar Max has followed Solar Minimum by just four years. If that is the case, the next solar maximum could be not all that far away in 2010 and a Solar Max is good news for D-Xing.

(GB2RS)

## Great Britain

### 500 kHz proposal

The Radio Society of Great Britain (RSGB) has proposed allowing radio amateurs in the UK to operate either 501-504 kHz or 508-515 kHz at a power of 10 W EIRP. "The allocation, if accepted, would extend amateurs' experimental work on other low and medium frequencies and thus aid understanding of propagation in those parts of the spectrum," the RSGB said. The RSGB proposed the two band options since they are no longer used for maritime telegraphy in the Western Hemisphere, their usage for non-directional aeronautical beacons is being phased out and the frequencies also are not likely to be reallocated to another service anytime in the near future. The Wireless Institute of Australia (WIA) recently announced plans to request the Australian Communications Authority (ACA) to establish an experimental amateur allocation at 500 kHz. The RSGB says its proposal was drafted in consultation with the International Amateur Radio Union (IARU) Region 1 500 kHz Working group, formed following World Radio Communication Conference 2003 (WRC-03) by the RSGB and chaired by the Union of Belgian Radio Amateurs UBA. The Working Group includes representatives from all three IARU regions. The IARU also favors a worldwide Amateur Radio band at 135.7 to 137.8 kHz and is seeking support for such an allocation at WRC-07. Further details of the RSGB 500 kHz proposal are on the RSGB Spectrum Forum Web site <http://www.rsgb-spectrumforum.org.uk/mf.htm>.

(ARRL N/L)

# Over to you

## Receiving and transmitting on low frequencies

I had a low frequency transmit licence for 11 years and with that did a lot of listening. I have also held an experimental licence AX2TAR.

I was able to use 1 kW from my QTH in Moonal, Southern Tasmania. The aerial was a 35 foot mast. During the daytime this set up was able to put a ground wave signal into Melbourne. The morse signals were picked up by Drew Diamond VK3XU, Greg Wamback, VK3CN both in Melbourne and Graeme Zimmer, VK3GJZ in the Latrobe Valley using Loop Stick antennas. Signals were also heard in other parts of VK3, VK5, VK7 and in New Zealand ZL. Code at 12 wpm was preferred by most listeners.

I also used SSB and with 17.5 db of RF clipping to put some body into the signals was copied in VK3, VK7 and ZL. When propagation was not the best CW could be copied when SSB could not.

The biggest challenge was working New Zealand amateurs other than Bruce ZL1WB who had a very good transmitting aerial. When I just wanted to listen to New Zealand amateurs on 181.4 kHz CW, I would go 2/3 the way up Mt Wellington and lay 200 feet of wire along the road side. I would resonate this to 181.4 kHz, amplify it and feed it into my FRG-100 receiver, run from the car battery. I built a unit that would plug into the phone jack of the FRG-100 resonant at 600 Hz with 50Hz bandwidth and a LM386 amplifier, which drove a loudspeaker. This unit was able to pick the CW from the noise, which was 10 db above it.

I have also been able to copy 138 kHz SSB at this location from Quartz Hill in New Zealand.

Hope this might inspire some of you to try LF.

**Robert Milne VK7ZAL**

Peter Gibson VK3AZL

# The copper loop for 70cm

## Note 1 inch =25.4 mm

**In May 2004 Amateur Radio, we reprinted a description of an all copper folded loop antenna for 2 metres by Dick Stroud, W9SR.**

In QST for July 2004, Dick adds 220 and 440 MHz to his range of copper loop antennas. In this abstract however, we will only consider the 440 MHz version. As before, this antenna can be constructed using standard copper water pipe and fittings available from your local hardware store or building supplier. The 440 MHz antenna is made of ½ inch tubing. As a slight change from the 2 m antenna, copper fittings are used to adapt the antenna to ½ inch standard pipe thread for mounting.

The dimensions and cutting lengths are shown in Figure 1. As mentioned above, all of the copper, brass and stainless steel hardware should be available from hardware, plumbing or specialist suppliers. The teflon material should be available from most specialist plastic suppliers.

As before, it is necessary to solder all of the components together, but it is not difficult. The ends of the tubing are first cleaned with steel wool and a thin layer of flux is added before assembly. It is an advantage to make an assembly jig out of plywood or similar material. The individual elements are then wired to this jig to keep them in the correct relationships. Heavy aluminium foil or sheet should be mounted between the ply and copper to prevent any accidental bonfires occurring during the soldering. When using the propane torch, the tubing should be brought to temperature before solder is applied.

Normal rosin cored solder can be used. If the copper is hot enough, the solder will be 'sucked' into the joint. Excess solder can be filed off when cool. When complete, any remaining flux should be removed and the copper can be polished using steel wool. The finished antenna can be sprayed with clear Krylon 1301 to preserve the finish. Alternatively, the antenna can be painted with an acrylic spray. Either way, be sure to mask the front and back of the connector along with the exposed parts of the gamma rod before painting.

The shape of the antenna is chosen so that the 50 ohm point on the tubing wall is roughly in line with the centre of the type N fitting. The ¼ inch gamma tube is placed through a hole on the inside wall of the main tubing and soldered into place, as per Figure 1. This tube goes all the way in until it hits the outside wall of the tube. The length of wire in the gamma tube is critical as it forms part of the gamma capacitor. The 14 gauge wire used is stranded and vinyl insulated. The combination of the tube, teflon sleeve and length of wire form the tuning capacitance. At 440 MHz, this amounts to about 6.4 pf. The wire and sleeve should both be snug fits.

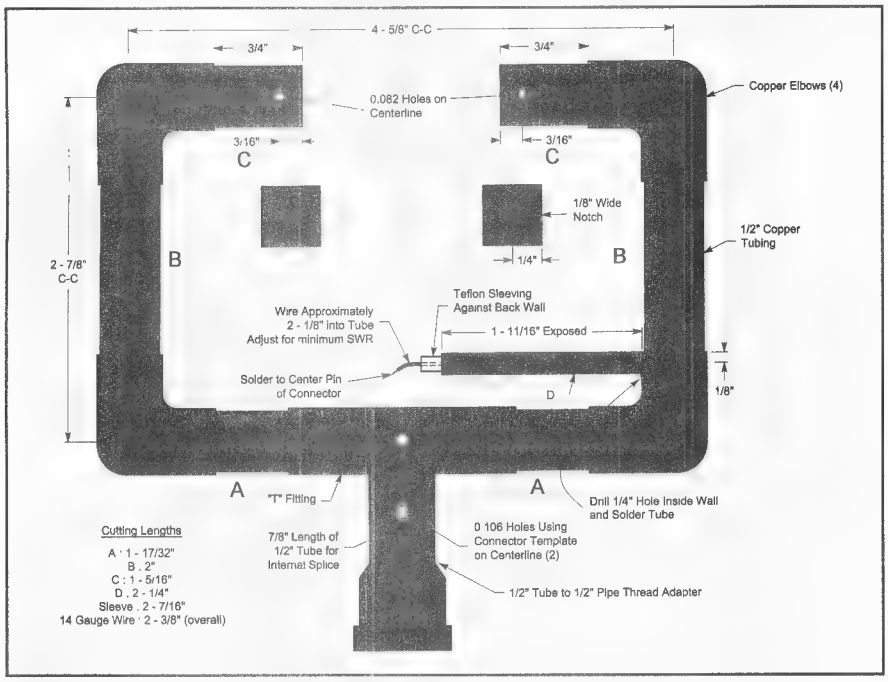



Figure 1 – Construction details for 440 MHz antenna

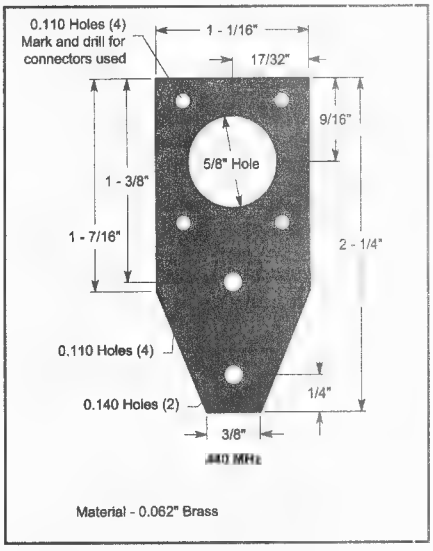



Figure 2 – Construction details for feed connector bracket

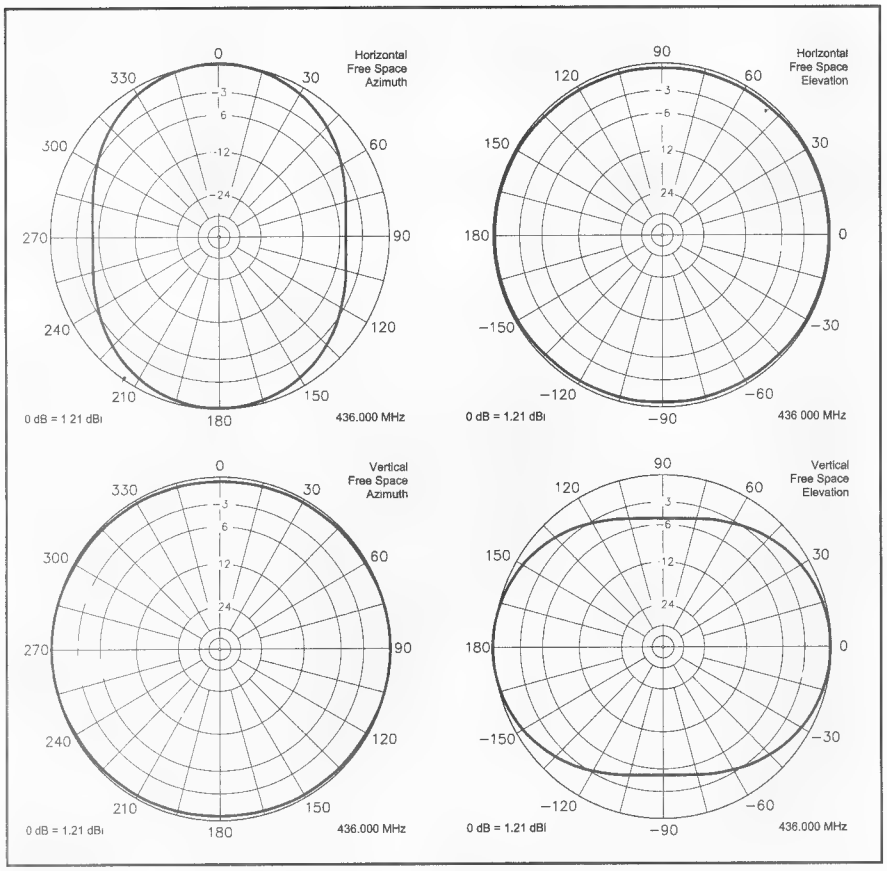



Figure 3 – Azimuth and elevation patterns for both vertical and horizontal polarization modes for 440 MHz antenna

Figure 2 shows the outline of the connector mounting plate. It is made of 0.062 inch, or similar brass stock and is attached to the copper antenna with two #6 x ½ inch stainless steel, self tapping screws at the points shown in Figure 1. The connector used is a type N, panel mount (UG-58/U). It is attached to the plate with suitable sized screws, lock washers and nuts. All hardware should be brass or stainless steel to prevent corrosion and the connectors rear terminations should be sealed against moisture penetration.

All testing should be done with the antenna at least 6 feet above ground and clear of any metal objects. Typical VSWR at resonance is less than 1.2:1. The power handling capability of the antenna is limited by the connector and should be at least several hundred watts at this frequency.

The centre frequency of the antenna can be adjusted from 428 MHz to 452 MHz. All tuning adjustments should be made by moving the two end caps, symmetrically relatively from the copper elbows. After adjusting the end caps to frequency, hold them in place with small stainless steel self tapping screws

The 2:1 VSWR bandwidth at 440 MHz is 11 MHz, making the antenna attractive for wideband applications such as ATV.

Polarization can be chosen by arrangement of the elbows and pipe fittings. For horizontal polarization, the antenna can be simply supported on a ½ inch threaded mast. For vertical polarization, the antenna should be mounted with the open side in the vertical plane. In this case, the support mast should be non-metallic to avoid detuning the antenna and upsetting the pattern. The cable should be routed back and away from the active part of the antenna. The azimuth and elevation patterns for both horizontal and vertical polarization are shown in Figure 3.

ar

# Silent key

## Moira Millgate VK8NW

Moira died in the Old Timers Nursing Home in Alice Springs, on October 4th.

Not a lot is known about Moira's early days, except that she born in about the year 1915.

In World War II, she served in the WRANS, (at HMAS "Harmon"), as a signal officer, intercepting signals for Intelligence purposes:

One of her duties was to copy overseas radio broadcasts, for the Australian Intelligence section to analyse.

She learnt the Japanese Kana "Morse" Code (all 80 characters of it!), so that she could intercept Japanese military transmissions.

Moira was fluent in French, Russian and German.

Theo (VK4MU), who used to run a Sunday morning net, told me that she sent beautiful CW. She was PMG (now Telstra) trained, and sent at about 25 wpm with perfect quality.

Her Adelaide contact was Bill Trezise, VK5RA (SK).

In 1983, she obtained her amateur radio licence, and joined ALARA in 1986.

She was laid to rest beside her husband, Geoff, on October 19th.

Thanks to those who helped me with this information: Theo VK4MU and Christine VK5CTY in particular.

I am interested in further details concerning this lady, and would appreciate any material.

Please e-mail me on dellio2@bigpond.net.au, or write to me, QTHR any callbook.

**John Elliott. VK5EMI**

ar

# New ADSL modem

## The continuing saga of getting broadband ADSL

Will McGhie

**Three days after deciding to cut my loses with the USB ADSL Modem and ordering the ADSL Ethernet Router modem, it arrived.**

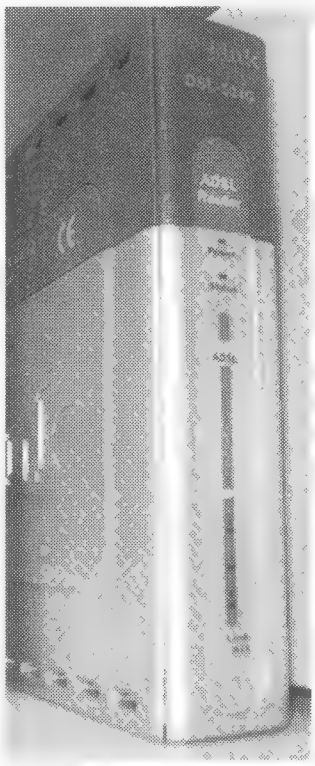
This modem uses a separate power source (mains) and you can connect up to four computers to the modem via the network connector from your computer. Also this modem does not use software, all is contained within the modem. All that is required is to connect the modem to the network card and it should work. There are few configuration requirements; the main one is "obtain an IP address automatically." If you are installing the modem on a new computer, which has not been set up for a particular ISP, then you have to do the usual mail etc setups.

This type of ADSL modem, when powered up, connects to the Internet automatically when you turn your computer on, and stays connected until you turn your computer off. It really does work well, but mine did not connect to the Internet! Part of the setup is to go to a particular Internet URL and do the ISP setup via a wizard that talks you through the ISP's requirements, such as user name, password and mail. My computer was already setup due to my dial up and this was not required. However trying to go to any Internet site did not work. It did not take long to figure out that the modem was not connecting.

A phone call to my ISP resulted in all sorts of things being tried. The modem was working okay, as my ISP could see my connection, but the computer would not allow a connection between it and the modem. The situation got worse as we worked through all sorts of possibilities and even got to the point that my dial up modem would not work! Even Internet Explorer and Netscape would load and then crash. Also my anti virus software (Vet) on boot up would bring up a warning saying, "network error." (This turned out to be important). One fundamental problem that was found was the IP addressing of the modem, for reasons unknown, would not keep an IP address and would just go back to all zeros on a computer re-boot.

To cut a long story short, after two hours the ISP person I was talking to said a reformat might be the only option! However, he did offer to put me through to the department that handled the hard ones, and this was now well into the hard basket.

The Technician I was now talking to went through all the basics and eventually established a connection between the computer and the Internet at a basic level. He was also able to get the IP addressing of the modem to work. Just how a lot of this happened is too lengthy to describe here but progress was being made. However the browsers (both Explorer and Netscape) continued to crash when loaded. Eventually he made the suggestion to un-install my anti virus software, Vet. This was done and it all worked! For reasons unknown Vet was preventing the correct operation of the computer port that allows access to the Internet. Vet had either configured itself wrongly or had become corrupted.



Just what had been the problem or problems who know? All sorts of things had been tried including the suggestion that the original installation of the USB ADSL modem had screwed up the computer. After two weeks and about eight hours in total on the phone, ADSL was up and running. I did learn that there were a lot of programs on my computer that I had no recollection of putting there, along with various popup and suspected spy programs. I run updated anti virus and have an anti spy program as well but even better checking would be a good idea.

One way to find these programs is to go to the install-uninstall program icon in the control panel and work through just what programs are there. Delete what you don't think should be there. Also go to msconfig via the start, run box and have a look at startup to find out just what is being loaded on startup. My ISP person was asking me to list all these programs and checking on the Internet just what these programs were. Many were deleted!

May I say that my ISP was most helpful and patient in getting my ADSL up and running. Sure that is their job but they were prepared to stick with it, and lets face it computers are complicated and there can be a dozen reasons why a particular problem occurs. Finding the problem can be very difficult, at least for the know a little bit about computers person. How the average person with little or no computer knowledge sorts these problems out I have no idea.

**15 & 16 January, 2005**

**Summer VHF Field Day**

# WIA welcomes new members

## June July

| | | |
|---|---|---|
| Owen | DUFFY | VK1OD |
| Brenton J | MEADOWS | VK5SZ |
| Marcus Richard | ROBINSON | VK2BUA |
| Earl R | RUSSELL | VK3BER |
| Maxwell D | STARK | VK3VI |
| I J | CHRISTIE | VK2ZIC |
| Kevin | FLEMING | L41082 |
| Paul | JAMES | L41081 |
| Steve G | LEATHEAM | VK2BGL |
| Raymond | STUART | VK4YRS |
| Sam | ADCOCK | VK5KSA |
| Peter | CLEE | VK8KZZ |
| Eric R | GRAY | VK3ZSB |
| Mark | GUEST | VK5HBI |
| Charles M | LEAHY | VK2SYD |
| Ata | MEHMET | L21213 |
| Terrence | THOMSON | VK8TT |
| Bill | PETERS | VK2ATP |
| Anna | GERBER | L41083 |
| Robert E | RANDELL | L10186 |
| Mark | BOWLES | VK2SMB |
| Dylan | CATOR | VK3JWC |
| John A | HARRIS | VK2FAD |
| Peter | ILLMAYER | VK2YX |
| Vic R | MACDONALD | VK4CA |
| Neil T | PEAKE | VK5NTO |
| Dallas L | EICHNER | VK5HBH |
| Gary E | NEILSEN | VK4KNE |
| Maurice | O'KEEFE | VK3KO |
| Chris | DIMITRIJEVIC | VK3FY |
| Ian R | AMPT | VK3IV |
| Gary | CROTHERS | VK4CUZ |
| Frank R | GLUZIK | VK3UBU |
| A R | BLAKE | VK2ALF |
| Rhett | DONNAN | VK3HAP |
| Julian | DRYDEN | VK2TED |
| Ken | MOORE | VK4AKM |
| Michael C | PATTERSON | VK4MIK |
| Cameron | STRUBLE | L41084 |
| Jack I | SWART | L21215 |
| C J | READING | VK7ZCR |
| Chris | EDMONDSON | VK4AA |
| Leslie A | HING | L21216 |
| Martinus P A | VAN BLADEL | VK3MF |
| Stuart | BRAUNHOLZ | VK7NXX |
| Mike | YOUNG | VK4TMM |
| Andreas | FASETH | VK5HAF |
| Peter B | HARDING | VK4JPH |
| Simon | RICE | VK8ZJZ |
| Jack | DYER | VK2TI |
| Gene | SPINELLI | K5GS |
| James H | SHILTON | VK3ZRG |

## August

| | | |
|---|---|---|
| Nicholas D | FISHER | L21217 |
| Nicola | SIGNORILE | VK6BOS |
| Tony | STONE | VK2TS |
| Harvey L | WICKES | VK4AHW |
| Derek T | STUBBS | VK5PAV |
| Sandra | HAND | VK2LSH |
| Neville R | BLYTH | VK1HNB |
| Paul | GALE | VK5ZKG |
| Lance W | HAYWARD | VK6TZ |
| Sasi | NAYAR | VK5SN |
| Richard | PIPE | VK5USB |
| Rodney | RUSH | VK4RA |
| Robert | WAEGELE | VK4TWR |
| Richard A | PHILP | VK3ZRP |
| Chris G | SPIKINS | VK6HCS |
| Graeme P | TREMELLEN | VK3GPT |
| Keith | ANGELL-JOHNSON | VK3TMW |
| Luke | ENRIQUEZ | VK3EM |
| Michael | THORNE | VK3BKK |
| John | THURSTUN | VK2DX |
| Francis | WEBER | VK2XVJ |
| Peter M | WHITE | VK2YPW |
| Eddie J | COPPINGER | VK4EDI |
| Ronald F | CROUCHER | VK4CRO |
| David | CUTHBERT | VK4YNM |
| Richard J | LAMMAS | VK4NRL |
| Patrick J | O'DOHERTY | VK2DPO |
| David | POTTER | VK7HAH |
| Leon | POWELL | VK4KLL |
| Peter | RICHARDSON | VK4TAA |
| Christian A | RYALS | VK2NGC |
| Frank | RYAN | L50375 |
| Michael | STRUIK | VK1TMS |
| Wayne E | STAPLES | VK4XAR |
| M | BEACHAM | VK3XXX |

## September

| | | |
|---|---|---|
| Lyn | BATTLE | VK4SWE |
| Les R | JORDAN | VK3TJ |
| David | MAYER | VK2HMD |
| John | PRELLER | VK1HAJ |
| Ian | CLAYTON | VK5AIC |
| John | JAMES | VK4CMA |
| K C | SELVADURAI | VK3EVG |
| Michael H | BAKER | VK6ZEB |
| Lorne | BONNELL | VK4TLB |
| Renato | LANGERSEK | VK4TNT |
| A J | MCLEAN | VK2KCE |
| Robert J | MCMANUS | VK2TVC |
| Alan K | POTTER | Q360236 |
| Stanley J | SONTER | VK2HEL |
| Raymond H | WALES | VK3RW |
| John | HOWLETT | VK6ZN |
| Glynn | HUGHES | VK5GP |
| Angus | MCDONALD | VK4HGP |
| Roy C | STEPHENS | VK4ARS |
| Willem | BEIMERS | VK4KPB |
| James W | MILLER | WA2UMP |
| Tom | SAMDERS | VK2XAU |
| David P | WALSHAW | VK5HDW |
| Doug | WATERSON | VK4HY |
| Tony H | DAWSON | VK1TGX |
| William | TWEEDIE | L21219 |
| Denis A | COOPER | VK4ACE |
| Greg | COUZIN | VK2ZGC |
| L J | MOSS | VK3CLJ |
| David | MUNN | VK4BDJ |
| Chris | O'BRIEN | VK3HGX |
| Glenn | PIERCE | VK2TEX |
| Andrew | SAYERS | VK2AES |
| Steven | SHELLEY | L31590 |
| Michael | TAYLOR | VK4XT |
| Dale | CAVIES | VK5DC |

## October

| | | |
|---|---|---|
| I G | PRYOR | L21220 |
| Robert J | MOTTLEE | VK4HAY |
| D | DEVENEY | L31562 |
| Garry B | BRIANT | VK3KYF |
| Robert | FERGUSON | VK3FPJ |
| Klaus-dierer | ILLHARDT | VK3WWR |
| Malcolm | MACFARLANE | VK3JPS |
| Andrew | ALBINSON | VK6XAA |
| Brad | LARDEN | VK2YYX |
| Mark J | SWANNACK | VK2HMJ |
| Karsten | THOLE | VK5ZKT |
| R J | BUHRE | VK4AIM |
| John | MORRIS | VK2BES |
| Ken A | THOMSON | VK2BQT |
| David | WESCOMBE-DOWN | VK5BUG |
| Kevin | PURVES | VK2KEV |
| Gianmario | DOLFEN | VK3NI |
| John R | GARDNER | VK7ZZ |
| Robert L | LEANE | VK2ZLV |
| Gary D R | PEARCE | VK2TWH |
| A J | PIN | VK2HXX |
| Hamish | ROUSE | L31592 |
| Ronald K | TURPIN | VK5BRT |
| Victor J | PIGGOTT | L31591 |
| Anthony | VAN VUGT | VK1VM |

# Propagation by the light of the silvery moon

## Lunar tidal influence on the ionosphere

Bill Isdale VK4TWI

**Twice a day the tide rises and falls, in most places so slowly that we don't take much notice of it but in some places the shape of the coastline channels the water into a fast flow or a rapid rise and fall. So much so that the energy is increasingly being put to work to generate electricity from the energy that would otherwise just slip away.**

What is the rise and fall of water, a fluid that lends itself to smooth movement, responding to?

Gravity, of course. The Earth's relentless gravity is pulling water down from where it may fall as rain towards the lowest point. The low parts of the surface of the Earth fill with water under the constant pull of the Earth's gravity.

Why is it rising and falling so regularly that tide times are reliably predicted and published with no apology that they may not be absolutely correct? Because the tide is produced by the gravitational pull of the moon, the orbit of which has been studied exhaustively and which is known in the finest detail.

Well, almost.

The clockwork universe that Sir Isaac Newton described with his law of gravitation in 1687 suggests planets running on invisible tracks in pleasing regularity, and many models of that have been built.

The simplified model, convenient for illustration, represents a system where a mass is thought of as a point source of the gravity that an object of its mass has. A small rocky planet will be proportionately more massive than a ball of gas.

This has not been a problem in practice and Newton's physics has served well enough for calculating the movement of the Earth, the moon and a spaceship for manned journeys to the moon. Everything has gone as predicted by Sir Isaac three centuries before we had the hardware to put the maths to that particular test.

But our observation of the tides at the seaside shows that the Earth is not a solid object, water on its surface is moving up and down as the gravity of the moon pulls upon it.

Less obviously, the land on which we stand and build our buildings is being distorted under gravity, pulled up by the Moon and, when it has gone by, back down by the Earth's gravity. The movement is slight but quite real.

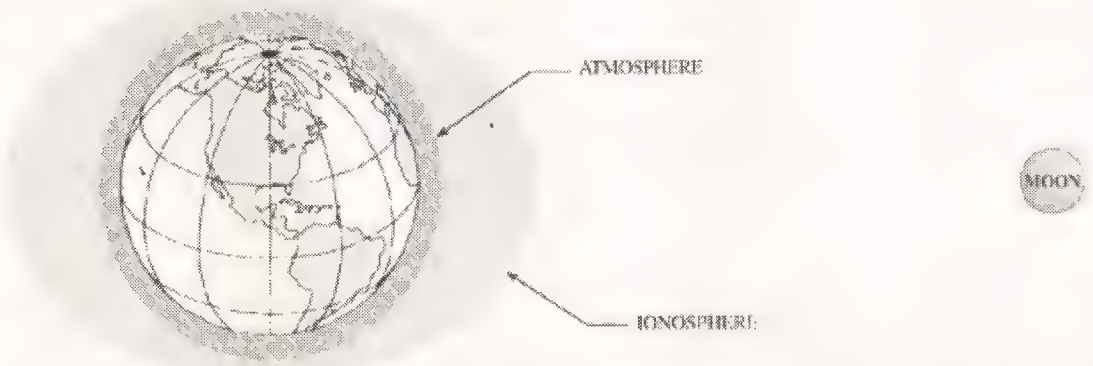
On a larger scale, the Sun and planets exert their gravitational influence on each other. The law applies to every material thing in the universe and everything attracts any other thing with a force that varies directly as the product of their masses and inversely as the square of the distance between them.

To take an example, Jupiter a massive ball of gas, orbits the sun and its gravity pulls on the sun inducing a velocity in it of about 12.5 metres per second, moving the Sun, relative to the centre of mass of the solar system, 800,000 kilometres, a little more than half the diameter of the Sun, as Jupiter and the Sun orbit around their mutual centre of mass. They are thought of as point sources of mass for the purposes of calculating their motion due to gravity but as big balls of gas they are being distorted as they are pulled towards each other by gravity while their momentum keeps them moving on their orbit, in a more or less stable condition.

Our Earth, much less massive, still has its influence and produces a velocity shift of 1 metre per second in the Sun, moving it by 450 kilometres a year relative to the centre of mass of the solar system.

Our atmosphere, fluid like the oceans, is deeper but more diffuse. It is pulled to the surface by gravity and rapidly thins with altitude so much so that a good sized mountain may take the intrepid climber high enough that lack of air at sufficient pressure may be a life threatening obstacle.

At great heights, between 50 and 200 kilometres above the surface, where the ultraviolet light from the Sun breaks the molecular bonds of the gases and creates charged particles, ions, gravity is still at work. The ionosphere is reflective to radio waves at certain frequencies, about 1 to 30 Megahertz, and this phenomenon is convenient for long range radio communication.



The solar cycle, waxing and waning over about 11 years, has been a useful indicator of radio reflectivity of the ionosphere. The Sun at the peak of its cycle, identified by the maximum number of sunspots visible on its surface, emits 2 to 2.5 times the intensity of ultraviolet light than at the trough of the cycle.

That gross indicator of the condition of the ionosphere is not the only indicator. Gravity has a part to play as well since the ionosphere, part of the ocean of air, is tidal just as the oceans of water are.

What this means for radio propagation via the ionosphere was considered by Harlan True Stetson (yes) Ph.D. Research Associate at the M.I.T. where he was the Director of the Cosmic Terrestrial Research Laboratory.

In his 1947 book, Sunspots in Action, published by The Ronald Press, New York, Stetson wrote that as far back as 1913 the London Electrician had published articles on the relation of wireless reception to the phases of the moon. He noted that in 1934 the distinguished scientist and radio engineer E.V. Appleton came to the conclusion that " with the passing of the moon about the earth there was a semi-diurnal variation of one whole kilometre in the height of the ionosphere."

Dr Stetson went on to note that he, Appleton "came to the conclusion that his observations indicated an ionospheric tide at the level of the E layer nearly six thousand times as great in magnitude as that indicated from the barometric pressure changes observed at the earth's surface."

Dr Stetson placed the E1 layer at about 100 km and the E2 layer at about 150 km altitude.

The good doctor considered the possible mechanism behind enhanced ionospheric propagation to be the Sun's rays falling on the moon and causing the emission of energy from its surface. He was looking to find something more significant than moonlight on the ionosphere as moonlight, he pointed out, is only 1/300,000 the intensity of sunlight, so he made something up.

There is however a more simple explanation.

William of Ockham, born in 1285,gave his name to the principle of applying the simplest hypothesis, Ockham's razor. There is no need to, and no excuse for, postulating some unknown thing to explain what is observed if it can be accounted for with a more simple explanation. An example for present purposes is that some mysterious lunar radiation is not called for to explain the improved radio reflectivity of the ionosphere when the moon's gravity will serve quite well to explain it.

The solution which I am suggesting was within Dr Stetson's grasp. He wrote, "It may be possible that even a small change in the distribution of ions can make a very large change in the intensity of the field of the radio wave received over a considerable distance."

He considered Appleton's observations of the tides in the ionosphere but did not close the ring he was building around the problem with the conclusion that the moon's tidal influence on the ionosphere was pulling a lens-shaped tide of the ionosphere along behind it and this, or the smoothing effect of its passing, is enhancing the mirror-like quality at radio frequencies which is so useful for radio wave reflection.

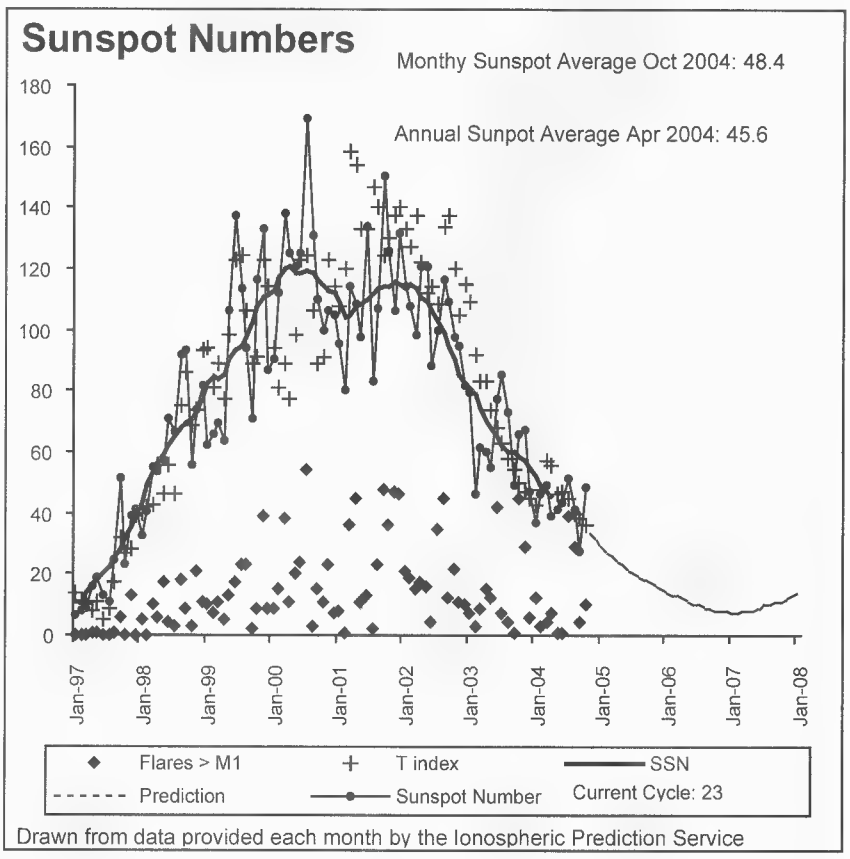
Dr Stetson observed maximum field strength on the path he was measuring, from a medium wave commercial transmitter in Chicago, when the moon was at 11 days and again at 23 days into its cycle of waxing and waning. He thought in terms of the sunlight falling on it but not in terms of what that much illumination of the moon's surface indicates, its relative position to the observer on the surface of the Earth and hence the position of the ionospheric bulge and smoothing effect in relation to the path of the signal being reflected.

This explanation for the observed phenomenon does not depend on strange rays yet to be discovered, only on well tested gravitation. It is able, as any hypothesis, which claims to be scientific, must be, to be tested and falsified if incorrect.

The necessary astronomy to know the position of the moon is readily accessible and signals which can reach the observer on a path via the tidal ionospheric bulge or the smoothed ionosphere behind it can be measured until the optimising effect, if real, appears. It may be on days 11 and 23 or some other days. It would be necessary to conduct a test for a significant period to see if a pattern emerges out of the "noise" of random variations.

Time and tide will tell if a real effect on radio propagation will be found by the light of the silvery moon.

ar



## Icom sales and service in Australia

We read with interest an article on page 45 forwarded by one of your readers. It is headed "Purchasing equipment from overseas". The reference he makes to the pricing of the IC-706MKIIG is not accurate. There are Australian Authorized Icom Dealers offering this product for sale at $1,399 RRP. There is also a reference to Icom Australia servicing what was not originally purchased in Australia. This too is incorrect. We are not willing to accept the liability of working on a radio we did not supply due to the fact that in the unlikely event that something else goes wrong we are then responsible for the repair free of charge.

We support the magazine, industry and freedom of speech. We would greatly appreciate however, being given the opportunity to confirm the accuracy of articles that relate to Icom before they are published.

**Paul Bannister**
National Sales Manager
Icom Australia Pty Ltd, www.icom.net.au

## You can't please everyone

I see there was some flak re the length of the repeater controller article in October.

On the other hand I have had a number of positive comments on the article (received by e-mail) and it has raised considerable interest (judging on requests for boards).

I guess it's a case of you can't please everyone.

One of the strengths of AR magazine is that there is variety in its articles and that you do try to cater for the widest possible audience.

Thank goodness AR hasn't fallen to the level of just descriptions of meetings and DX worked. A high technical component on a range of amateur subjects is what I and many of my amateur friends want, some gutsy and state of art articles balanced with simple hints/ideas. At the same time we recognise that there are some who enjoy the reports, contest information, news and DX information. Organisational matters such as those covered in "WIA Comment" must be included.

Personally I think your balance over the last year or two is about right. It appears that the critic is not a constructer, that's his choice, but there are still many of us around that see AR as a technical hobby, one that enables us to improve our own knowledge and create and construct interesting projects. Colwyn, don't let our AR magazine go the way of some publications that are all gab and no guts.

**John VK5DJ**

## Financial viability of proposed NSW "Division"

Doug VK2DDR has asked a very pertinent question.

At the recent EGM I asked a similar question regarding the membership trend in the future. While I am fairly certain that there will be no significant financial problem because of the rental income from Dural and Parramatta I cannot see other than a gradually falling membership. Under the new arrangements the new WIA is under no obligation to pick up any shortfall.

I think it is wholly possible that the membership of the division will over the next three to five years fall to about 100 or perhaps even less. If this happens then there will be enough funds to maintain the premises but not to do much else.

I don't think any of the existing members would want to see "ownership" of the two million plus assets fall into such a small number of hands.

The solution to this problem is I believe in how we define membership.

The ideal membership arrangement would be that all WIA members living in VK2 be members of the "division". It was put to me that one objection to this definition was that someone who is currently a member but not a WIA member would be disenfranchised. This is a valid argument, but I cannot see a fair way around it.

As the premises are self supporting, with a little over I believe, the division could offer to the WIA the use of the premises at peppercorn or a low non-commercial rent the use of the Dural station and the Parramatta premises as offices and meeting place. The saving for the WIA would be of the order of $35,000 a year. This could be the VK2 contribution, each year and every year to the new WIA. The details of such an agreement would have to be negotiated. Such events as a shortfall in rental income etc would have to be anticipated.

The "division" will remain and would be a property management body elected by WIA members in VK2. This will ensure the property remains in the hands of a significant number of members and is put to use for amateur radio. The property cannot be sold or transferred without significant stamp duty costs so the legal entity called the WIA NSW Division must continue to exist.

When I made a suggestion like this at the EGM I was howled down in certain quarters but no one came up with a better alternative.

**Barry White VK2AAB**

## A young amateur says thanks

First of all I would like to say thank you for including my article in *Amateur Radio* magazine (October AR). I am very happy to report that my antennas have been fixed and as of now are all working. Because you put my article in AR I have made some new ham friends in different states. I have a huge list of all the hams that helped me to get started.

Once again, thanks.

**Hayden VK7HAY**
honeywoodnrs@bigpond.com.au

**Views expressed in the 'Over to you' column are those of the authors, and do not necessarily reflect the policies of the Wireless Institute of Australia.**

**Send contributions to:**
**The Editor, Amateur Radio Magazine, 34 Hawker Crescent, Elizabeth East SA 5112 or email: edarmag@chariot.net.au**

# HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

December 2004
T index: 24

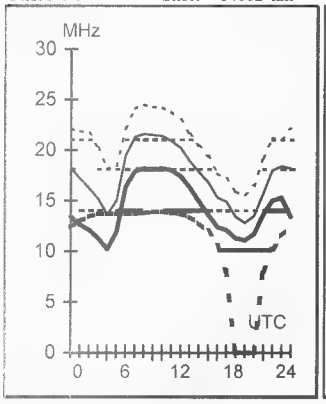
Legend
Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

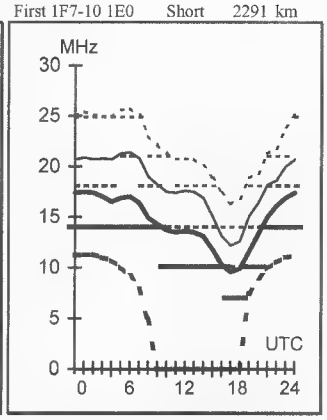
- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

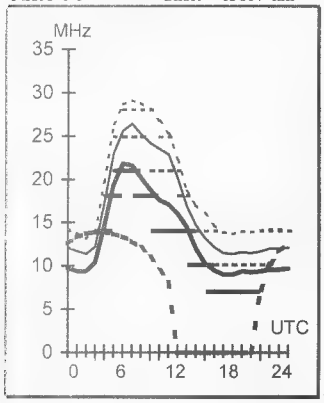
**Adelaide-Accra** 242
First F 0-5 Short 14682 km



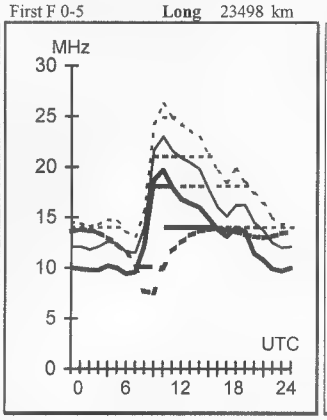

**Brisbane-Auckland** 123
First 1F7-10 1E0 Short 2291 km



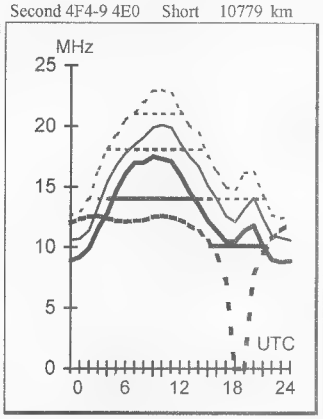

**Adelaide-Moscow** 318
First F 0-5 Short 13807 km



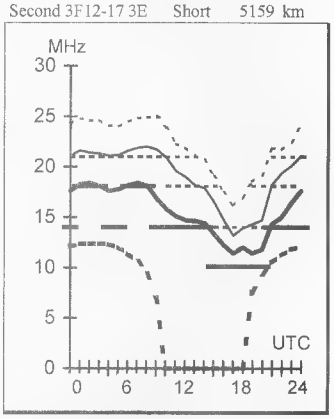

**Brisbane-London** 147
First F 0-5 **Long** 23498 km



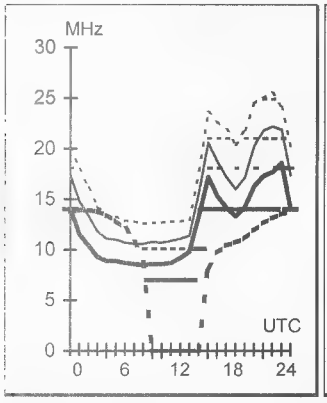

**Canberra-Capetown** 219
Second 4F4-9 4E0 Short 10779 km



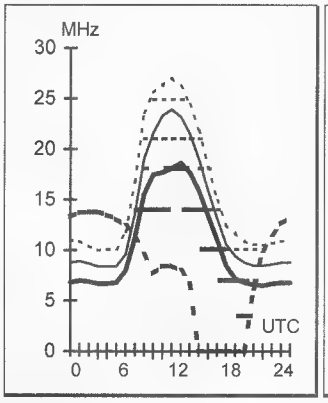

**Darwin-Invercargil** 144
Second 3F12-17 3E Short 5159 km



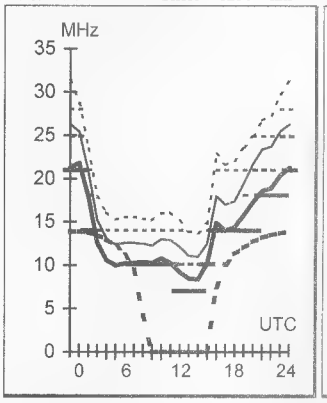

**Adelaide-ottowa** 58
First F 0-5 Short 16901 km



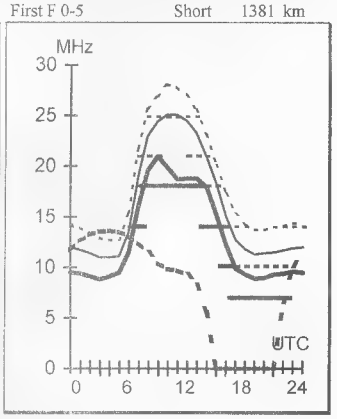

**Brisbane-London** 327
First F 0-5 Short 16526 km



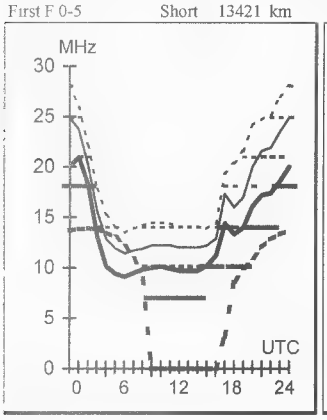

**Canberra-Los Angeles** 62
First F 0-5 Short 12309 km



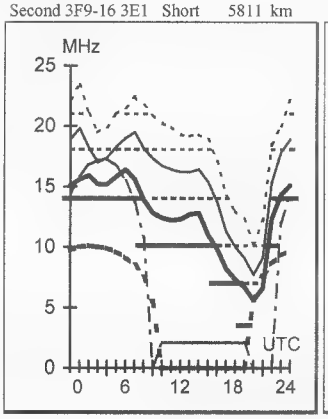

**Darwin-Paris** 322
First F 0-5 Short 1381 km



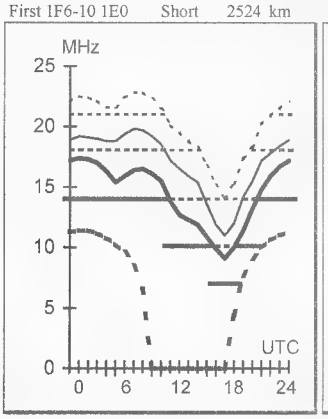

**Adelaide-Vancouver** 48
First F 0-5 Short 13421 km



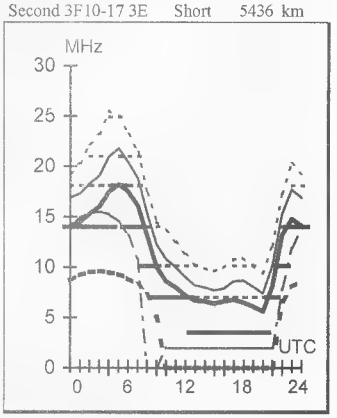

**Brisbane-Manila** 320
Second 3F9-16 3E1 Short 5811 km



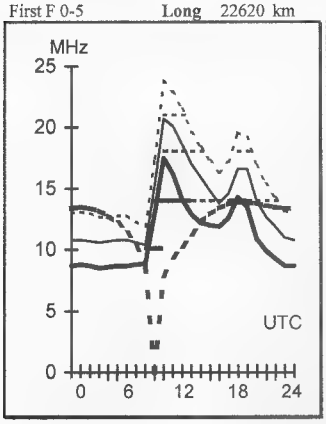

**Canberra-Wellington** 115
First 1F6-10 1E0 Short 2524 km



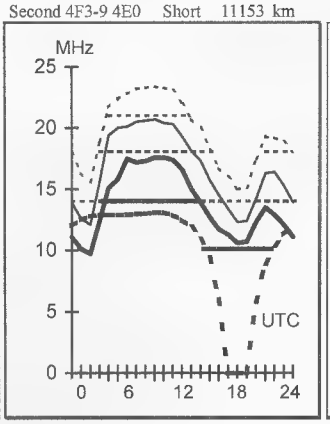

**Darwin-Tokyo** 10
Second 3F10-17 3E Short 5436 km



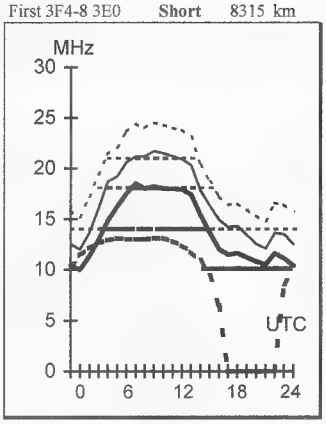
**Hobart-London** 123
First F 0-5 **Long** 22620 km



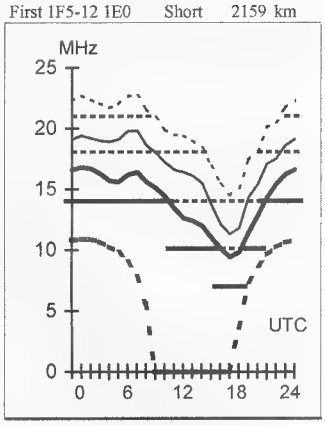

**Melbourne-Lusaka** 241
Second 4F3-9 4E0 Short 11153 km



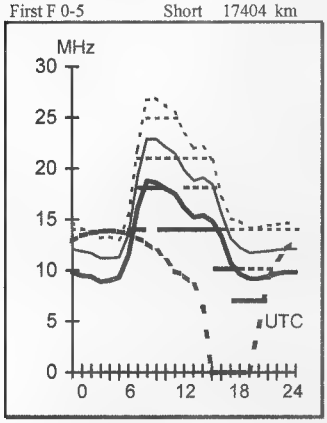

**Perth-Johannesburg** 248
First 3F4-8 3E0 **Short** 8315 km



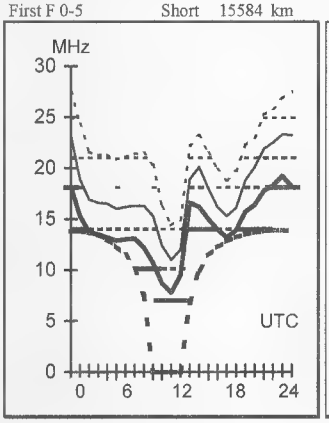

**Sydney-Auckland** 106
First 1F5-12 1E0 Short 2159 km



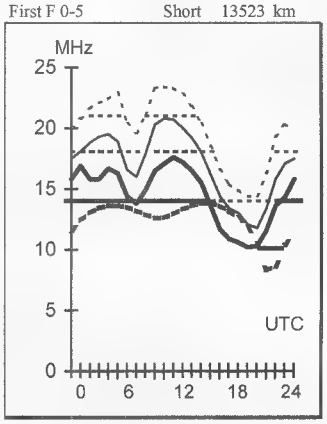

**Hobart-London** 303
First F 0-5 Short 17404 km



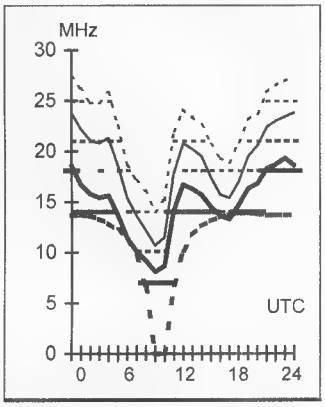

**Melbourne-Miami** 94
First F 0-5 Short 15584 km



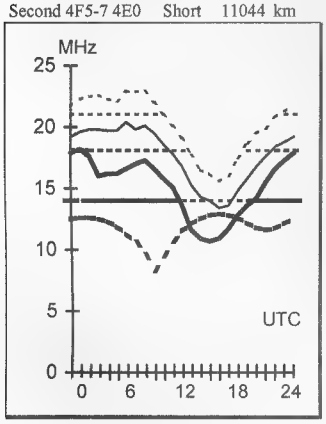

**Perth-Rio de Janeiro** 203
First F 0-5 Short 13523 km



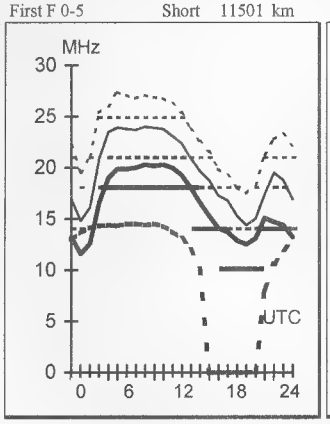

**Sydney-Barbados** 119
First F 0-5 Short 16155 km



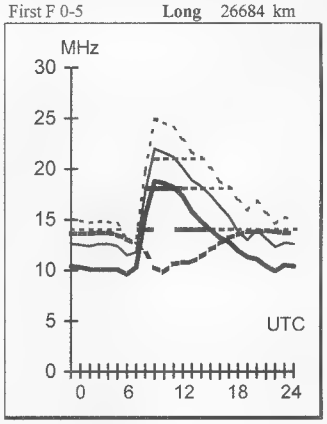

**Hobart-Montevideo** 161
Second 4F5-7 4E0 Short 11044 km



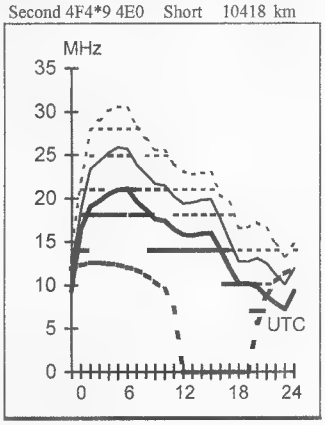

**Melbourne-Nairobi** 258
First F 0-5 Short 11501 km



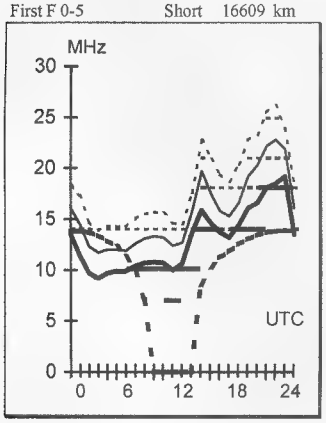

**Perth-Rome** 123
First F 0-5 **Long** 26684 km



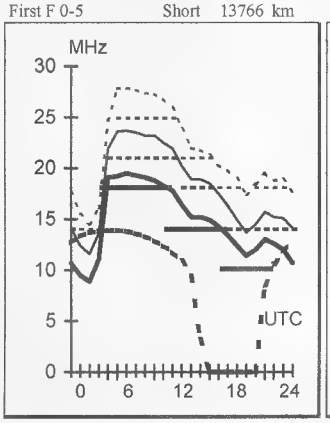

**Sydney-New Delhi** 302
Second 4F4*9 4E0 Short 10418 km



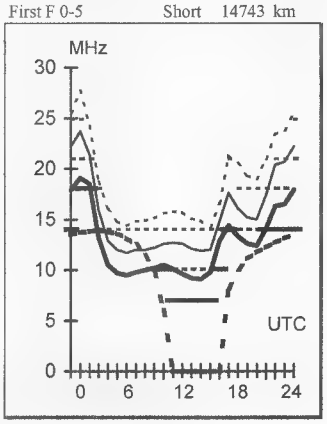

**Hobart-New York** 80
First F 0-5 Short 16609 km



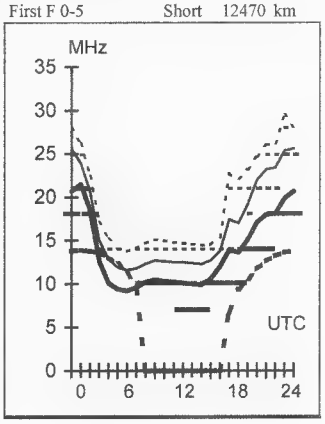

**Melbourne-Tel Aviv** 287
First F 0-5 Short 13766 km




**Perth-San Francisco** 66
First F 0-5 Short 14743 km




**Sydney-Seattle** 47
First F 0-5 Short 12470 km



# Hamads *classifieds* FREE

## WANTED ACT

• **Collins equipment** looking for 30S-1 linear, 30L-1 linear, KWM-2/2A transceiver, 32S-3/3A transmitter, 32V-3 AM transmitter, also 75S-3A/3B/3C, 51S-1, 651S-1, 851S-1, 75A-3/4, 390A receivers. ART-13 AM xmtr, KW-1, KWS-1 SSB xmter. Also looking for 312B-3,312B-4,312B-5. Microphones-SM-1/SM-2/SM-3 and MM-1. Also seeking 516F-2, PM-2 and MP-1 power supplies, DL-1 dummy load, 302C-3 pwr meter, 399C-1SPKR/PTO. 136B-2 noise blanker. KWM-380 or HF-380 transceiver. Contact Chris at: christo@senet.com.au Phone mobile 0409 379 507

## FOR SALE-NSW

• **Wilson System SY-1**, 4 element beam $350, **Kenwood TS-870** $1800, **prop pitch motor** $200, **DX-2 amplifier** with QSK $3000. Tom VK2OE@arrl.net 2/25 Andrew St Inverell NSW 2360, Phone 0413 796 851 8-9 PM.

• **Sattrak 111 tracking controller** for 12 satellites c/w interface cable, $200. **G3RUH 400 baud PSK Mk11 TLM decoder**, $150. **60cm al dish** c/w (German SSB), **2.4 GHz/144 MHz down converter**, $500, **converter** only $475. **Mode J 144MHz (German SSB) filter**, new $60. **Yaesu G5400B** AZ/EL antenna controller, AZ motor in hd alu cage, el motor attached to 2 inch dia hd alu pipe incl thrust bearing, offer includes an 11 foot 3 section boom, inner section 4 foot long alu tube, outer sections are each 3.5 foot long fibreglass material and attached to the inner section, long multi core control cables included, $850. Two identical **7 el gamma match 144 MHz yagi beams**, $45 each. **Heavy duty 240 volt VARIAC** $75. All ono. Art VK2AS QHTR 02 9416 7784.

• **Panasonic KX-P1180 printer**, $15. **2 x FM-828A**, $40 ea, **2 x FM-92A** plus 4 control heads, $100 total. **4 x LDF4-50** female N connectors, new; $20 ea. **8 metres LDF5-50 coax**, $30. **6.5 metres LDF4-50 coax**, $20. Roger Woodward, VK2DNX, Rogerwoodward10@hotmail.com, Phone 02 9547 2546

## WANTED NSW

• **AIWA MIC & FR-100B.** I am looking for the guy in VK3 who phoned me with these items. Sorry I lost your no. Pls ring me again. Also looking for **FTV-650** to suit FTDX gear, **Collins 312b-5,312b-4 & power supply** for KWM-2a. Mike VK2EFT Phone 02 6647 3271 rautem@dodo.com.au.

## FOR SALE VIC

• **Antennas triband HB-35C** as new $500. **Duoband 20/15 m** 3 ele $100. **10 m** 4 ele $80. **Home brew quad hubs and fibreglass poles** $60. **Tektronix** 100 MHz oscilloscope $500. Phone David for details 0438 393 550.

• **Shack clearance: FT-2700RH, FT-702** ant coupler, **FT-77** HF transceiver, CB on 10 m band, power supply - heavy duty, CW key, 3 ele beam 10, 15, 18, 20 metre, manuals. Total $600. Apply Malcolm Lee, Willow Lodge Village, 6 Celia Court, Bangholme 3175, fax 03 9706 4106.

• **Radio mast** telescopic triangular, 3 sections, 7 to 18 metres, hinged at base, coax, guy wires, bolt on ladder $500. Ken VK3KJR, QTHR, Phone 03 9806 0123, e-mail kenjohnrolls@hotmail.com.

• **40 ft Southern Cross Tower** $250. **Diawa DR-7500A** antenna rotator $300. **Kenwood IF-232C interface** $80. **ICOM IC-PCR1000** computer controlled receiver $500. **Win Radio G3** computer controlled receiver $250. **MC-55** hands free mobile microphone $30. ***AR* magazines** boxed in volumes 1988 - 2001. ***Silicon Chip*** magazines bound volumes 1988 to 2004. VK3ZQB QTHR, e-mail vk3zqb@dodo.com.au, Phone 03 5568 1308.

• **ICOM IC-2350H** dual band FM mobile transceiver S/N 02275 in VGC dual freq read out. 144 MHz 50 watt output, 430 MHz 35 watt output $425 + postage. **Yaesu FT-2200** FM mobile transceiver S/N 3K080102 VGC, 144 MHz 50 watt output $275 + postage. **Yaesu FT-301S** HF transceiver (30 watt output) S/N 71120577 VGC. Excl to run HF linear 160 to 10 m (no WARC Bands) $300 ONO + postage. Mark VK3EME QTHR Phone 03 5443 9391 or vk3eme@impulse.net.au.

## WANTED VIC

• **Hammarlund SP-600-JX** general coverage communications receiver. Roy VK3ARY QTHR, Phone 03 9803 1213.

• **FTDX-400, FTDX-401 to FTDX-560, FTDX-570** series transceiver CW filter or even a junk box transceiver with the filter in it. The filter may be marked YF-3C or YF-31C. I am restoring an FTDX-570 and would like to add the CW filter. Donald VK3IT, AH Phone 03 5278 9321 or mobile 0409 314 500.

• **Information on injector RF noise suppression** in the Jackaroo Turbo Diesel. Philip VK3YAZ Phone 0417 014 636

## FOR SALE QLD

• **Book by R Newsome, *Early Radios in Australia: How to Collect, Understand and Restore them*.** $15 plus post 600gms. Peter Hadgraft Phone (07)3397 3751, e-mail peterhadgraft@yahoo.com

## WANTED QLD

• **ICOM R-9000 or R-9000L receiver.** Ron VK4QM Phone 07 5488 0268 e-mail rhvette@gympie.big.net.au.

• **70 to 80 foot Southern Cross Aerial Communication Tower.** Can dismantle if located within approximately 200 km of Brisbane. Contact David VK4DH, Phone work 07 3842 7727, home 07 4664 1105, mobile 0417 282 270 e-mail david.holton@landmark.com.au.

• **Duplexer** at the right price suitable for 63cm. Rick VK4NRL, QTHR. e-mail tlammas@bigpond.net.au

• **Tandy data bank pocket tone dialer,** catalog no. 43-144 (working). VK4NS QTHR e-mail vk4ns599@optusnet.com.au

• ***Silicon Chip* magazines** for club library, Jan 1990 to Dec 2002. Peter Hadgraft (07)3397 3751, e-mail peterhadgraft@yahoo.com

• **Channel crystals for older 2m rig** for Brisbane and/or Gold Coast repeaters TX f/9, RX f(minus or plus 10.7)/9. VK4AXM QTHR or viktorlukas@yahoo.com.au

## FOR SALE SA

• **ATN 2m beams** 16 el 6.34m boom, $75. **10 el** 3.080 m boom $50. Both for $100. VK5ZE QTHR, Phone 08 8255 7586.

• **Boonton Radio Company, NJ USA inductor boxes,** Type 590A, tuning range one each 20-30Mc, 20-50Mc, 25-70Mc, 30-100Mc, 70-230Mc,

# About hamads....

- Hamads may be submitted by **email** or on the **form on the reverse of your current Amateur Radio address flysheet**. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

**Email:** *newunltd@bigpond.net.au* **Fax:** *03 9756 7031*

**Postal:** *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793*

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one only Type 103A 5-14 Mc. L/C and approx Q details on written application only. No charge, you pay postage only, or collect Stansbury. VK5KGS QTHR

• **Kenwood R-1000** receiver in as new condition. Now in aged care home. No antennas allowed. $200. Purchaser to collect. Peter Russell L50753, Phone 08 8260 7972

• **Tower three inch square steel tubing,** tilt over and crank-up, 30 to 45 feet, concrete base and guys. Three element triband beam rotator and cables. Dismantled, ready to move. $500 ono VK5ZB QTHR. Phone 08 8276 1053.

### FOR SALE WA

• **16 m Hills wind-up tower with 204-BA 4 element 20 m beam and rotator, 6 m Cushcraft beam and 2 m/70 cm collinear,** c/w planning permission on 983 m² corner duplex reticulated block 12 km South of Perth. Close to freeway access and complete with large 5 bed 2 bathroom air conditioned home with garages for 3 cars, lounge/dining/family room inc.bar. Asking price $325K. Phone Ron VK6RV QTHR Phone 08 9457 4144

### WANTED WA

• **VHF high band valve amplifier,** made by Commonwealth Electronics, uses 2 X 6/40 tetrodes. Prefer in working order. Model number 160PA1a. Contact Trevor Sorenson VK6ZTJ Phone mobile 0401 391 234, e-mail tam.elec@bigpond.com.

### MISCELLANEOUS

• We have an opening shortly in P29 country (Port Moresby) for a **Radio Workshop Service Manager.** Any qualified and experienced professionals should e-mail to me a resume as soon as possible, or contact me for further details. Gary Gregory

• **The WIA QSL Collection requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

### TRADE ADS

**PSK-31, SSTV, RTTY SOUNDBOARD**
Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

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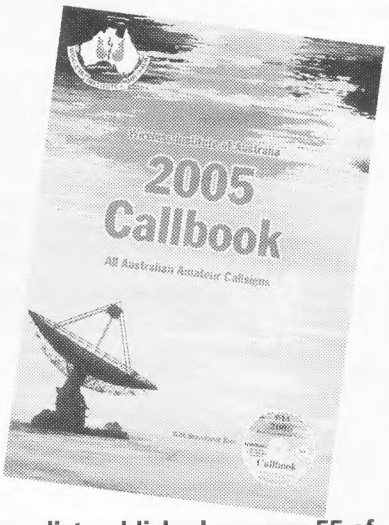


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| National Office | Contact | News Bulletin Schedule |
|---|---|---|
| 10/229 Balaclava Road,<br>Caulfield North VIC 3161,<br>Australia | Phone 03 9528 5962,<br>Fax 03 9523 8191,<br>10am to 4pm daily,<br>nationaloffice@wia.org,<br>www.wia.org | Subject to change see www.wia.org, follow national news prompts.<br>Contact nationalnews@wia.org.au,<br>National VK1WIA news is distributed to all states. |

| Advisory Committees | Contact | News Bulletin Schedule |
|---|---|---|
| **VK1 Australian Capital Territory** | secretary@vk1.wia.ampr.org | Sundays at 11.00 am<br>VK1WIA 7.128, 146.950,438.050<br>Tuesday at 8.0pm 146.750, 147.375, 438.025 |
| VK1WX Alan Hawse<br>VK1ZPL Phil Longworth<br>VK1ET John Woolner | | |
| **VK2 To be advised** | | |
| **VK3 Victoria** | Phone 03 9885 9261<br>advisory@wiavic.org.au | VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs |
| VK3JJB John Brown<br>VK3PC Jim Linton<br>VK3APO Peter Mill | | |
| **VK4 Queensland** | Phone 07 3221 9377<br>qac@wia.org.au | VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs |
| VK4ERM Ewan McLeod<br>VK4ZZ Gavin Reibelt<br>VK4KF Ken Fuller | ewan.mcleod@bigpond.com | |
| **VK5 South Australia and Northern Territory** | Phone 08 8294 2992 | VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area. |
| VK5NB Jim McLachlan<br>VK5APR Peter Reichelt<br>VK5ATQ Trevor Quick | jimac@picknowl.com.au<br>peter.reichelt@bigpond.com<br>vk5atq@chariot.net.au | |
| **VK6 Western Australia** | Phone 08 9351 8873<br>vk6council@iinet.net.au | VK1WIA Sunday 9.0am via WIA network |
| VK6NE Neil Penfold<br>VK6XV Roy Watkins<br>VK6KZ Wally Howse | vk6ne@upnaway.com<br>vk6xv@bigpond.net.au<br>vk6kz@bigpond.com | |
| **VK7 Tasmania** | Phone 03 6234 3553 | VK1WIA via Tony, VK7AX 8.55am |
| VK7ZAX Phil Corby<br>VK7DG Dale Barnes<br>VK7KK Reg Emmett | phil.corby@tassie.net.au<br>vk7dg@wia.org.au<br>regemm@ozemail.com.au | |

**Notes**

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

**Now available from your local Amateur Radio Organisation**
**see list in November issue**

# 2005 Callbook

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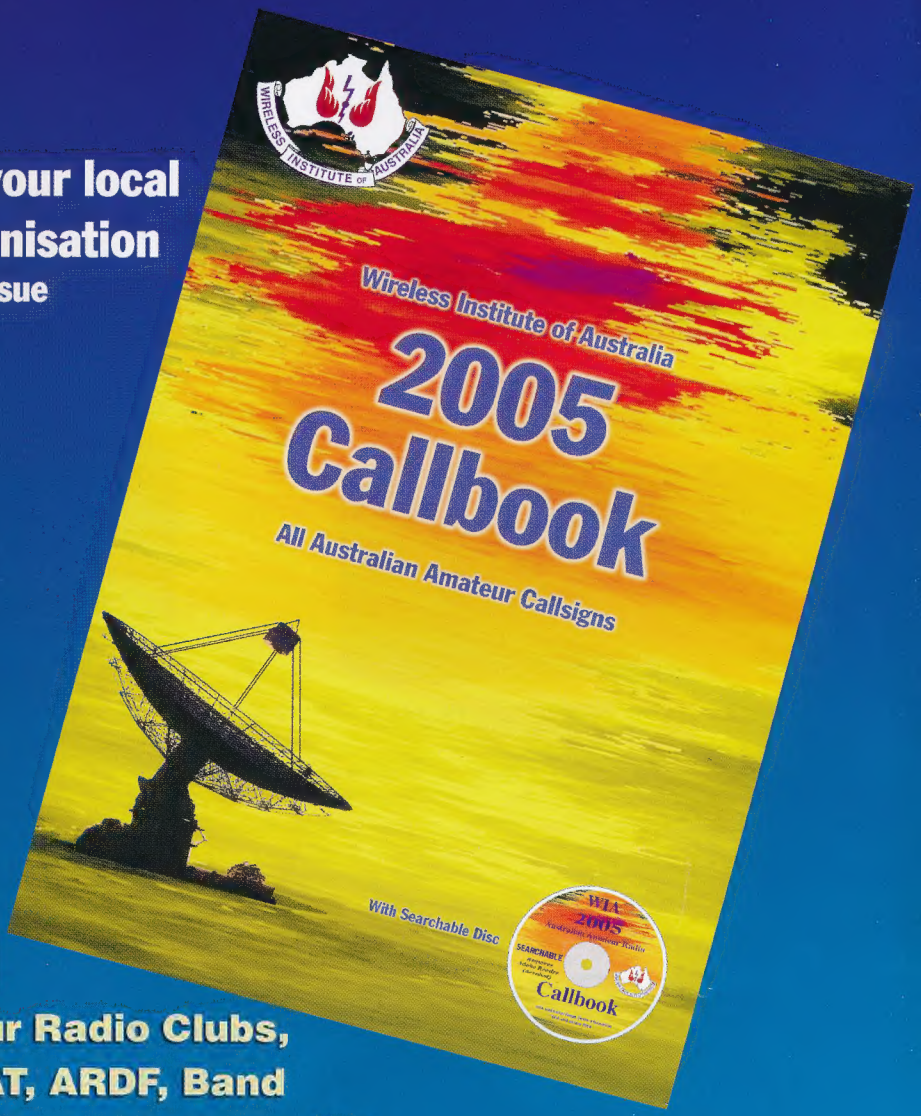


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## How to get your copy

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**(03) 9528 5962 or nationaloffice@wia.org.au**

| Prices from National Office | Pick up | Posted |
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